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COMMONWEALTH OF PENNSYLVANIA



Report of the

Department of Fisheries

From December 1, 1914, to
November 30, 1915

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COMMONWEALTH OF PENNSYLVANIA,
DEPARTMENT OF FISHERIES.

NATHAN R. BULLER,
COMMISSIONER OF FISHERIES.

ROBERT R. FEATENBY,
CHIEF CLERK.

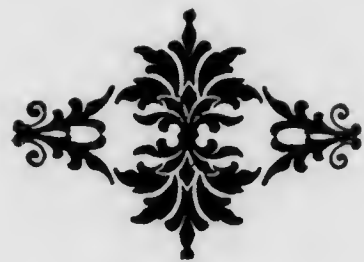
BOARD OF FISHERY COMMISSIONERS.

N. R. BULLER, President.
JOHN HAMBERGER, Erie.
W. A. LEISENRING, Mauch Chunk.
JOHN C. OGDEN, Johnstown.
CHARLES H. THOMPSON, Philadelphia.

68168

SUPERINTENDENTS OF HATCHERIES.

CORRY HATCHERY, No. 1, William Buller, Corry, Erie County.
ERIE HATCHERY, No. 2, Phil. Hartman, Erie, Erie County.
BELLEFONTE HATCHERY, No. 3, W. F. Haas, Bellefonte, Centre
County.
WAYNE COUNTY HATCHERY, No. 4, G. W. Buller, Pleasant
Mount, Wayne County.
TORRESDALE HATCHERY, No. 5, J. R. Berkous, Holmesburg,
Philadelphia.
ERIE AUXILIARY, No. 6, A. G. Buller, Union City, Erie County.



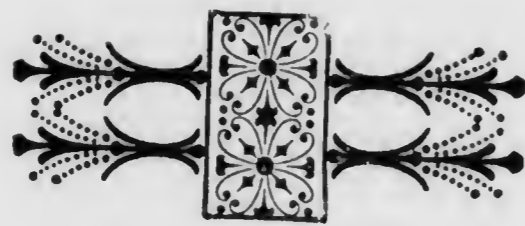
LETTER OF TRANSMITTAL

Honorable Martin G. Brumbaugh, Governor of Pennsylvania:

Sir:—Herewith we have the honor to transmit to you the report of the operations of the Department of Fisheries for the year ending November 30, 1915.

Respectfully,

(Signed) N. R. BULLER, Commissioner.
JOHN HAMBERGER,
W. A. LEISENRING,
JOHN C. OGDEN,
CHARLES H. THOMPSON.



IN MEMORIAM.

Inasmuch as the infinite workings of Almighty God have taken from our midst during the past year two of our co-workers, we, the members of the Board of Fishery Commission, desire in this manner to publicly express our sincere sympathy and appreciation of the late Henry C. Cox, a former member of the Board of Fishery Commission and Barton D. Evans, formerly Chief Clerk of the Department of Fisheries and Secretary of this Board, to the members of the bereaved families.

REPORT
OF THE
BOARD OF FISHERY COMMISSION

Honorable Martin G. Brumbaugh, Governor of Pennsylvania:

Sir:—Herewith we have the honor to submit the report of the operations of the Department of Fisheries of Pennsylvania for the year ending November 30, 1915.

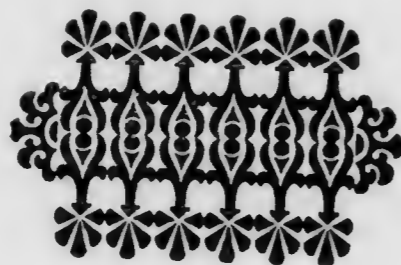
The plans for the rehabilitation of the hatcheries and the replacement of all temporary structures by permanent ones was carried on throughout the year, the result being that the State of Pennsylvania can boast of having the best and most complete hatcheries in the United States.

The hatching building at Pleasant Mount will be completed this year, and it is expected that this plant will be the most complete and modern establishment of its kind.

No permanent work was done at the Union City hatchery owing to the lack of control of the water supply, and until the Department is able to get control of this water supply at this hatchery no permanent work will be done. The Department was very much handicapped in its work of rehabilitation from lack of funds, but this Board is glad to announce that much good and permanent work has been accomplished.

It is a well known fact that Erie is the largest fresh water fish market in the world and the hatchery at the port of Erie is commensurate with the requirements and is a credit to the Commonwealth. The hatchery building was completed some two years ago but much work has been done during the year in the way of installing aquariums on the second floor and otherwise beautifying the grounds. The Department has received at all times the hearty co-operation of the Water Commissioners of the city of Erie, and with this co-operation has been able to accomplish much good. The site at Erie is an unequalled one for a fish hatchery by any site in the United States.

There has been added to the Department's grounds at the Torresdale hatchery about two acres of land. This land has been reclaimed by the city of Philadelphia and some extensions made to its filtration plant at Torresdale. This reclaimed land is along the river front and means much to this Department. It is expected that



an addition will be made to this hatchery after the next session of the Legislature when funds will be available. It is also contemplated to improve the grounds, building new and substantial ponds throughout, and otherwise beautifying the property. The Department's shad work is done at this station. However, there are facilities at this hatchery for the hatching of other fish.

A new hatching building was erected at Bellefonte, the former building being in a very dilapidated condition; in fact it was almost ready to fall down and it was not safe to work in it. A substantial brick building has been erected at this place. Many new concrete ponds were built and the hatchery is practically complete.

Much permanent work has been done at the Wayne County hatchery. Concrete ponds have been built and a new hatchery is now under course of construction. It was expected that this hatchery would be completed, but labor conditions prevented this. This will be the training school of the Department for fish culturists. When they are not needed at the other hatcheries they will be sent to Wayne County and receive instructions from expert fish culturists. When the ponds are completed it is expected that sufficient bass will be propagated at this station to supply the demands made upon the Department. The water at this hatchery is under absolute control, which is one of the most important factors in the propagation of bass.

The work at the Wayne County hatchery was very much hampered owing to the small number of men and teams with which the Superintendent had to work, and at the same time care for and propagate fish at this hatchery. It will take at least a hundred thousand dollars to fully complete this hatchery. When the location of this hatchery and the great amount of field work which may be carried on is taken into consideration, the Board feels that it is money well spent. A larger force of well trained men who will be available at any time is needed at all the hatcheries, and for this purpose larger appropriations must be made. If the hatcheries are not fully manned the facilities for supplying fish when the hatcheries are completed will be wasted.

The plant at Corry is practically complete. The Department expects to build some bass ponds for the propagation of bass, but this cannot be done until after the next session of the Legislature when funds will be available. The demands made upon the Department for fish of all kinds is increasing yearly. The fishermen demand that all streams be stocked and in order to do this it is very imperative that more funds be available.

Another question which the Department is giving its most serious attention is the pollution of streams, and when this report goes to print an anti-pollution campaign will be underway.

Much attention has been given to the question of fishways by the Board during the year, and it must admit that this is one of the biggest problems it has to face and which has as yet never been satisfactorily solved. The dam in the Susquehanna river at McCall's Ferry built by the Pennsylvania Water & Power Company has proven to be an absolute barrier to the ascension of shad. To overcome this situation many plans have been submitted to the Commission, but it was not taken into consideration the force which has

to be met at this dam. The present fishway which has been erected on the York County side of the river, upon advice of the present Commissioner, is, in the opinion of prominent fish culturists, to be the best step in this direction which has yet been made. It is the consensus of opinion, however, that no practical fishway is in existence, and it is doubtful whether or not there ever will be. It is hoped, however, that some fishway will be found which will be practical for the ascension of shad.

Under the provisions of the Act of April 22, 1913, P. L. 112, the Commissioner of Fisheries is authorized to ascertain whether the Pennsylvania Water & Power Company has complied with the decree of the Court of Dauphin County and to ascertain whether adequate provision has been made for the passage of fish. Acting under the provisions of this act, the Commissioner of Fisheries, on advice of the Attorney General, directed the officers of the Pennsylvania Water & Power Company to secure the advice of an expert on fishways. The Company at once took up this matter and are now working on the extension and improvement of the present fishway.

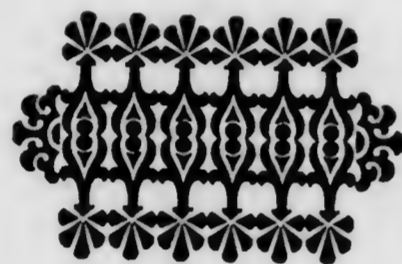
This Commission trusts that the next session of the Legislature will give to the Department of Fisheries sufficient funds to enable the Commissioner to employ at least the thirty wardens allowed by law. This branch of the Department should receive the careful consideration of the Legislature, as the Department at the present time is very badly handicapped, owing to the small force of wardens it has. The small number of men makes the traveling expenses very much heavier than would be the case were the thirty allowed by law at the Department's command. The wardens must be commended for their good work as they have done much in educating the manufacturers with reference to the pollution of streams.

The Department has co-operated during the past year with the fishery authorities of other States and with the United States Bureau of Fisheries, also the authorities of the Dominion of Canada, the result being that the Department was enabled to secure a supply of white fish eggs, pike-perch, muscullonge and lake trout eggs. Much good has been accomplished through this co-operation.

This Board desires to impress upon the Legislature the necessity of appropriating adequate appropriation for the expenses of the Commission. The members of this Commission receive no compensation other than their traveling expenses, and as the appropriation for this purpose is small, it has been impossible to hold as many meetings as desired during the year. In order to carry on the work of the Commission properly it is necessary that enough expense money be appropriated to allow them to attend the meetings.

Very respectfully,

JOHN HAMBERGER,
CHARLES H. THOMPSON,
JOHN C. OGDEN,
W. A. LEISENRING.



REPORT OF THE COMMISSIONER OF FISHERIES

Honorable Martin G. Brumbaugh, Governor of Pennsylvania, Harrisburg, Pennsylvania:

Sir:—I have the honor to herewith submit the report of the operations of the Department of Fisheries for the year ending November 30, 1915.

It has been the policy of this Department since my incumbency as Commissioner of Fisheries to do work of a permanent character, and I have been replacing the old dilapidated wooden structures by buildings of a substantial and permanent character, which will be, when completed, a credit to the Commonwealth of Pennsylvania. On account of the meager appropriations this work has necessarily gone much slower than if the necessary funds were available. It has been my policy to confine the work to the completion of one hatchery at a time rather than do a little at each hatchery. The Erie and Corry hatcheries are practically completed, and the Wayne County hatchery will in the very near future be completed.

A new hatching house was erected at the Bellefonte and Torresdale hatcheries, and there still remains at both these plants much permanent work to be done.

Very little work was done at the Union City hatchery on account of the water supply, and until the Department gets control of this supply, no permanent work will be done at this point.

I hope that the next Legislature will realize the importance of the work of the Department of Fisheries and grant the necessary funds to carry out the work as outlined. If this is done Pennsylvania will be able to boast of a Department of Fisheries equal to any in the United States and which will do credit to this great Commonwealth.

The work of rebuilding the hatcheries has, of course, interfered with the propagation of fish, but I am glad to be able to say that the distribution for the present year is over double that of the previous year. This speaks well for the Superintendents of the various hatcheries as it shows that they are all putting forth their best effort to get the fish out to the people of the Commonwealth. With the exception of the commercial fish, all the fish now sent from the hatcheries are one year old, varying in size from 3 to 7 inches. This method gives the best satisfaction and brings the best results. The following is the distribution for the year:

BASS:

Small mouth, fingerling,	5,659
Large mouth, fingerling,	1,965
Small mouth, adult,	281
Calico, adult,	165
Rock, adult,	133
White, adult,	30

CATFISH:

Channel, adult,	3
Yellow, adult,	6
White belly, one-year-old,	43,000
White belly, adult,	3,283

CRAPPIE:

Adult,	112
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EELS,	87
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FROGS:

Adult,	3
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GOLD FISH:

Adult, (for public),	61
One-year-old, (schools),	3,872

HERRING:

Lake, fry,	126,747,500
Lake, eggs,	269,969,000

MUSCALLONGE:

Fry,	499,800
Adult,	52
One-year-old,	50

MINNOWS,	346,512
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PERCH:

Yellow, one-year-old,	6,669
Adult,	10,446
Fingerling,	6,200
Fry,	116,000,000
Eggs,	54,600,000
Pike, fry,	17,096,000
Fingerling,	20,000

PIKE:

Blue, fry,	64,506,000
Blue, eggs,	270,262,000
Blue, one-year-old,	19

PIKE:

Gar, adult,	2
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PICKEREL:

Adult,	1,000
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SUNFISH:

Bluegill, one-year-old,	75,050
Adult,	5,781
Red breasted, adult,	1,440
Lake Erie, adult,	675

SHAD:

Fry,	3,640,000
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STURGEON,	8
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SHEEPS HEAD:

Adult,	2
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TERRAPIN,	12
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TROUT:

Brook, one-year-old,	1,311,800
Adult,	4,721
Two-year-old,	41,750
Eggs, eyed,	630,000
Brown, one-year-old,	59,950
Adult,	3,961
Lake, one-year-old,	249,900
Eggs, eyed,	203,000

TADPOLES,	105,925
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WHITE FISH:

Eggs, eyed,	25,110,000
Fry,	3,326,400

Total,	954,900,285
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FINANCIAL STATEMENT.

The following table shows the receipts and expenditures of the Department of Fisheries for the year ending November 30, 1915:

	Received from State Treasurer.	Balance on hand December 1, 1914.	Expenditures.	Balance on hand November 30, 1915.
Hatcheries,	\$44,482 64	\$10 31	\$44,482 64	\$10 31
Wardens,	16,847 49	49 23	16,847 49	49 23
Contingent fund,	1,000 00	212 52	*1,107 35	6 19
Commissioners expenses,	1,387 57		1,387 57	
Counsel fees,	584 93		584 93	
Operating tug, "Commodore Perry,"	5,126 62		5,126 62	
Operating cruiser, "Anna,"	602 77		602 77	
Buildings, ponds, extensions, etc.,	29,152 07		29,152 07	
Field work,	4,634 11		4,634 11	
Fishways,	896 67		896 67	
Presque Isle peninsula,	9,656 27		9,656 27	
Deficiency,	750 97		750 97	

*\$98.98 refunded to State Treasurer; not included in statement.

The following moneys were paid to the State Treasurer during the year being derived from the following sources:

Commercial hatchery licenses,	\$190 00
Fines for violations of the fish laws,	5,247 72
Seine licenses,	49 40
Tidewater seine licenses,	12 00
Lake Erie licenses,	2,920 00
Carp permits,	125 00
Confiscated property,	12 89
Refunded cash,	13 08
Total,	\$8,570 09

ITEMIZED EXPENSES OF HATCHERIES.

The following table shows the itemized expenses of each hatchery for the year ending November 30, 1915:

	Salaries.	Labor.	Traveling expenses.	Material.	Food.	Incidentals.	Total.
Bellefonte,	\$3,485 00	\$461 33	\$1,754 21	\$1,427 59	\$1,614 44	*\$1,070 01	\$9,812 58
Erie,	2,950 00	339 84	622 09	1,243 46	230 69	605 75	5,991 83
Erie Auxiliary,	2,940 00	537 57	1,327 41	477 15	5 40	285 33	5,572 86
Torresdale,	3,150 00	542 30	534 09	628 19	245 79	†1,108 16	6,208 53
Wayne County,	3,005 00	488 88	851 33	935 56	315 25	681 04	6,277 06
Corry,	4,667 00	625 85	996 93	801 90	936 47	473 05	8,501 20
Miscellaneous,	\$20,197 00	\$2,995 77	\$6,086 06	\$5,513 85	\$3,348 04	\$4,223 34	\$42,364 06
Total,							**2,118 58
							\$44,482 64

*Includes item of \$600.00 for water rent.

†Includes item of \$611.66 for light.

**Includes purchases made by Harrisburg office; not charged against any particular hatchery.

SHAD SEINE LICENSES.

Under the provisions of Section 5 of the Act of May 1, 1909, P. L. 353, the Department is authorized to issue licenses for the use of a seine for the purpose of taking shad, carp, suckers and alewife. During the season twenty-seven licenses were issued and the licensees reported to this Department a catch of 4,526 shad, valued at \$1,990.23. There were also reported a catch of 8,094 pounds of suckers valued at \$655.34, and 3,016 pounds of carp, valued at \$209.55, making a total catch of food fish other than shad 11,110 pounds and valued at \$964.89.

The catch of shad during this season was 50% lower than that of 1914. This being due to the very low temperature of the water during the open season for the taking of shad. This was not only in the Susquehanna River but also in all tide-water streams. In 1913 there were thirty licenses issued compared with twenty-seven this year, but the three additional licenses would not have brought the catch of shad up to the catch of 1914.

The table which follows does not give the exact catch of shad as many were taken by dip nets. The number taken in this manner

could not be ascertained by the Department. The following table shows the catch of shad, suckers and carp as returned to the Department by the licensees:

	Shad.		Suckers.		Carp.		Number of licenses issued.
	Number.	Value.	Pounds.	Value.	Pounds.	Value.	
Bucks,	255	\$152 50	7,701	\$616 00	2,650	\$191 25	14
Delaware,	1,684	520 28	393	39 34	56	2 80	2
Lancaster,	2,587	1,317 45	.....	.....	310	15 50	6
York,							5
Total,	4,526	\$1,990 23	8,094	\$655 34	3,016	\$209 55	27

LAKE ERIE FISH INDUSTRY.

The reports sent to the Department of Fisheries by the various companies who operate at Erie, shows an 8½% gain in the fish business over the year 1914. This is very gratifying as it shows that the fish business at the Port of Erie is increasing.

The production of fish in 1915 was 13,583,622 pounds, valued at wholesale at \$427,200.78. When it is taken into consideration that the Commonwealth of Pennsylvania can only boast of 40 miles of shore line on Lake Erie, the production of fish at this port shows the enormous business done by the companies. The Port of Erie is the largest fresh water fish market in the world and every Pennsylvanian should be proud of this fact. The nets that are used every day in the Lake run into hundreds of miles. When it is considered that Erie is one of a number of fishing ports located on the Lake, the total production of fish would be enormous. Millions of dollars are invested in the boats and tackle used in taking the fish, and warehouses where they are handled. The fish industry of the Port of Erie alone gives employment to hundreds of men.

The Pennsylvania Department of Fisheries prides itself in the fact that this immense business is due to the artificial propagation of fish by this Department, the United States Government, and other States, and is safe in saying that if it were not for the artificial propagation done by the Department the production of fish would not nearly equal the amount produced at the present time. It is the consensus of the fishermen on the Lake that the work done by the Pennsylvania Department of Fisheries is invaluable, as they know that before artificial propagation was taken up the catch of fish had fallen off to such an extent that fishing was no longer profitable to

Fishing from concrete breakwater—Erie harbor.



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them. The immensity of the business is not shown by the figures given above as the wholesale price is shown and the consumers pay from 50 to 100% advance on these figures, due to the freight and the handling of the fish dealers at their respective homes.

The fish industry at Erie means much to the Commonwealth of Pennsylvania, as it is a means of supplying a cheap food supply to the people and speaks well for the value of artificial propagation of fish. If the Lake can be kept stocked with fish, other lakes not as large, and streams, in Pennsylvania can be restocked to such an extent that they will reach their former state of productiveness.

When the hatcheries are worked to their full capacity and the laws are observed by the fishermen, and public co-operation is extended to the Department, there will be no difficulty in bringing the streams and lakes up to their former state. The Department desires to impress upon the minds of the public in general, as well as the fishermen of Pennsylvania, that they should be proud to point to Erie and proclaim its value as a fresh water fish market, as it is, as above stated, the largest fresh water fish market in the world.

The following table shows the production and value of fish for 1915:

	Pounds.	Value.
Cisco or lake herring,	8,161,811	\$263,656 21
Blue pike,	4,795,544	126,385 51
Yellow perch,	104,809	3,524 53
White fish,	359,078	29,886 51
Lake trout,	6,237	333 38
Pike perch,	10,760	722 88
Catfish,	1,133	47 51
Carp,	71,007	1,003 09
Sturgeon,	1,018	203 34
Miscellaneous,	72,225	1,437 92
Total,	13,583,622	\$427,200 78

COMMERCIAL FISH HATCHERIES.

Under the provisions of Section 11 of the Act of May 1, 1909, any person or persons may engage in the artificial propagation of any species of game or food fish for the purpose of selling them, by applying to the Department of Fisheries and paying a license fee of \$10.00 each year.

Every sale of fish must be accompanied with an invoice showing the number of pounds sold, date of sale and to whom sold. Under the provisions the Department issued seventeen licenses during 1915. The hatcheries report a business for the year valued at \$60,592.75. This shows a gain in the business of 1915 over that of 1914 of about 28%. The artificial propagation of fish is a very valuable one and the Department co-operates with the commercial men in every way

possible, as it believes that the business of propagating fish artificially should be fostered and every encouragement given to the men who do this work. A uniform invoice was adopted by the Commercial trout growers, on advice of the Department, the form of which is shown herewith. Before this form was adopted the Department found that each hatchery had a different form which they used and in order to make the work uniform the trout growers were called together and after much discussion the form recommended by the Department was adopted by them.

All the trout eggs which are hatched at the several hatcheries under the control of the Commonwealth are purchased from the commercial trout growers of Pennsylvania as the Department believes since they have invested their money in these plants they should be given preference when the Department is in the market for a supply of trout eggs.

The following table shows the out-put of the hatcheries:

	Pounds.	Number.	Value.
Dead brook trout for market,	53,383	186,266	\$33,754 89
Brook trout, live, mature,		163,611	10,947 39
Brook trout, advanced fry,		570,054	1,168 93
Brook trout, eyed eggs,		27,965,555	13,617 14
Brook trout, green eggs,		980,000	294 00
Black bass,		8,953	285 00
Gold fish,		9,525	297 50
Sunfish,		4,937	134 90
Miscellaneous,			93 00
Total,	53,383	29,889,906	\$60,592 75

WARDENS.

While the primary business of the Department of Fisheries is the propagation of fish and the restocking of the streams, the Legislature in its wisdom has also devolved upon it the important duties of enforcing the laws against forbidden methods of fishing, and also against the pollution of the streams.

The Commonwealth of Pennsylvania with its 46,000 square miles is an Empire in itself through which run thousands of streams and hundreds of lake. To patrol these streams thoroughly would require a force too large to be considered, but in this case the Legislature has allowed the Department the appointment of 30 wardens, yet in its wisdom it only appropriated sufficient money to pay for 10. This would give each warden about six counties and a territory so large that it is utterly impossible for him to do it the full justice that is demanded.

Complaints pour in constantly to the Department of Infractions of the fish law and the Department does its best to cover the cases,

but in most instances the distances are far, the traveling expenses are heavy, and by the time the warden reaches the spot the violators have either fled or their neighbors decline to testify against them.

With over 40,000 manufactories in the State it is utterly impossible for the small warden force to do full justice in regard to looking up the cases of pollution, especially as under the rigid requirements of the Courts the evidence has to be so direct and conclusive with no break whatever in the chain. There are many manufacturers that do not run a constant stream of refuse into the water, but at intervals. Some of them at night, showing, it would seem, a deliberate desire to evade the law. In no instance has the Department been able to secure a conviction of any such violators where it has had to depend upon the testimony of the residents of the place, because no one took the trouble to get samples of the refuse and to get them in such a way that there could be no mistake in showing to the court that the pollution in question came from the manufactory charged with the offense.

When all is considered, however, the Department is gratified with the splendid work done by its small force, not only in making would-be violators of the law timorous, but in many cases bringing about a clarification of the streams without resorting to the force of the law. By tact and persuasion they have induced the manufacturers to take steps to remedy the trouble, and the result, as said above, has been most gratifying.

Last Spring the Department called upon the Department of Police for assistance in enforcing the provisions of the law against illegal fishing. The Superintendent, Major John C. Groome, responded most heartily and furnished a number of details which were sent to the sections from which the most numerous complaints came, and the result attained merely went to prove how efficient a force Pennsylvania has in its State Police. In every instance where they appeared in the neighborhood they gathered in some violators of the law and by the swiftness of their action and the celerity of their movements they brought about such a feeling among the would-be violators of the law that for the time being at least no further complaints were heard from these sections.

It is rather a curious fact that in some sections of the State the violations of the fish law by the inhabitants thereof are not regarded as flagrant, but woe betide the stranger who enters their gates and thinks that he will break the law. Upon these strangers the neighborhood calls upon the Department to inflict the direst penalties of the law, and in some of the cases where the State Police were sent in the result had rather a humorous side, because the State Police gathered up some of the natives they found violating the law, whereupon loud remonstrances poured into the Department that the police had been sent for to arrest the intruders from other sections and not the peaceful dwellers in their own community.

It is an open question to the Department whether it would not be the best thing to take away from it the warden service and place all the protection and enforcing of the laws in the hands of the Police Department, which is so fully and thoroughly equipped for the work. The addition of the wardens now authorized by the Department to the Police Department would give that Department the necessary number of men to do the work efficiently, and one of the

advantages that would arise would be from the fact that the police would have 250 to select their details from, and the men sent on an errand would not be familiar to the people in the section to which they are sent, as the wardens necessarily become from the fewness of their numbers. It probably would be desirable for the Department to have several wardens whose duty it would be to attend the pollution cases, because the pollution cases require certain training in order to bring the cases efficiently before the court.

The Department of Police is organized for the detection of criminals and their arrest and conviction. Every man is thoroughly trained at the quarters before he is put to work, and this police force is now acknowledged everywhere to be the most efficient body of men in the country. If the enforcement of the fish laws was given to this Department, and they had the added force of men now authorized for the Department of Fisheries, the State could be most efficiently patrolled, and in cases of necessity, as many men could be concentrated at a given point as would be required to do the work.

With the knowledge that the State Police were constantly looking after violators of the fish law, the Department is thoroughly convinced that violators would be very scarce, and with the scarcity of violators the public would learn the value of enforcing the fish laws from the increased number of fish there would be in the waters of the State, and with this knowledge would grow up the sentiment that the fish laws must be enforced.

The little force of wardens have been most efficient and active in performing their duties, but owing to the large territory which each one must necessarily cover, of course the showing is not so good in the total as it would be if the whole force of 30 men had been at work. Every complaint that reached the Department was investigated at the earliest possible moment, but it is extremely difficult, if not impossible, to secure convictions where the violators were not taken red handed by the wardens.

The scent grows cold in two or three days, and neighbors are loath to testify against another neighbor or are deterred by fear that the violator of the law will take his revenge by burning their buildings. In scarcely a dynamite case has the Department been able to secure conviction on information. So far as prosecutions of the pollution cases go, prosecutions on information fail absolutely, because the witnesses have not sufficient technical information or knowledge of the circumstances to furnish exact evidence which the court requires in cases of pollution.

It is very gratifying, however, to feel that the wardens have done good work, and in their immediate sections have almost entirely broken up illegal fishing, and brought about the clarification of streams that seemed impossible two or three years ago. The Department insists that the wardens shall use tact and make no arrests for merely technical offenses. Women and children are rarely, if ever, willful violators of the law, and when found with illegally taken fish their attention is called to the matter and the law is explained to them and they are warned not to violate the law again.

Such cases have not been many, but have been purely technical violations where a fish is short part of an inch, or some fish like a rock bass has been taken for a sunfish. Indeed, experience has shown

that where children have the law explained to them, they have really become valuable assistants in enforcing the law, for in their childish way if they see a grown person taking a fish illegally, they are apt to promptly call his attention to the same.

The arrest of people for merely technical violations of the law, serve no good purpose, but is apt to prove an irritant to the community who will then raise a clamor that some innocent person is fined for killing a fish undersize, while a manufacturer who allows filth to run into a stream killing fish by the thousands, escapes with merely a light fine.

Of course, all laws are meant to be enforced, but to be enforced the law must be backed up by public sentiment, and this public sentiment will only sustain the law when it thoroughly understands its purpose. The Department is absolutely convinced that when the majority of the people of Pennsylvania understand the purpose and value of the fish laws they will support themselves with the same determination that they support the laws that are passed for the encouragement of the public schools.

The small number of wardens it is now possible to employ renders the traveling expenses exceedingly heavy owing to the distance that the men have to be sent. Another trouble is that it is difficult to detail two men for work on account of the expense, when experience has shown that the best work is performed by two men in company.

POLLUTION.

Pollution of the streams of the Commonwealth is the most serious and most stupendous problem which the Department of Fisheries has to meet. When you take into consideration that Pennsylvania has located along her streams 48,000 or more industries which are invariably running the refuse from their plants directly into the streams, the magnitude of this problem is brought to the readers mind with much force. Much adverse criticism has been hurled at the Department of Fisheries by people who are not familiar with the work which the Department of Fisheries is doing. The streams of the Commonwealth which have been polluted for many years cannot be cleaned in a few weeks or a few months. It takes much longer to do this work, and to do it properly the Department must have the necessary funds with which to follow up this work. When it is taken into consideration that the Department has at its command only ten men and is expected to do this work in a thorough and efficient manner in a short time, the folly of the demand is more clearly brought to your mind. In order that this work may be carried on in a proper manner the Department ought to have at its command a warden located in each county, and have the necessary funds with

which to pay them, and the Department hopes that the next Legislature will realize the importance and magnitude of this work and appropriate to the Department the necessary funds.

Section 16 of the Act of May 1, 1909, P. L. 353, provides:

"That it shall be unlawful for any person to put or place in any waters within the Commonwealth any electricity, or any explosive or poisonous substances whatever, or any drug or any poisoned bait, for the purpose of catching, taking, killing or injuring fish; or to allow any dye stuff, coal or gas tar, coal oil, saw dust, tan bark, cocculus indicus (otherwise known as fish berries), lime, vitrol, or any of the compounds thereof, refuse from gas houses, oil tanks, pipes, or vessels, or any deleterious, destructive, or poisonous substances of any kind or character, to be turned into, or allowed to run, flow, wash, or be emptied into, any of the waters aforesaid, unless it is shown to the satisfaction of the Commissioner of Fisheries, or the court, that every reasonable and practicable means have been used to prevent the pollution of waters in question by the escape of deleterious substances. In the case of the pollution of waters by substances known to be injurious to fishes or to fish food, it shall not be necessary to prove that such substances have actually caused the death of any particular fish: Provided, That nothing in this section shall prohibit the use of explosives for engineering purposes, when a written permit has been given thereof by the proper national, state or municipal government. Any person violating any of the provisions of this section, shall, on conviction as provided in section twenty-seven of this act, be subject to a fine of one hundred dollars."

The law plainly states that no deleterious matter must be run into the streams, but it does not say how this refuse is to be kept out of the streams. This is one of the many problems which the Department had to solve, and it is very gratifying to the Department to be able to say at this time that a system of filtration has been worked out by warden, J. P. Albert and Commissioner Buller, which will absolutely take care of refuse and purify the water insofar as aquatic life is concerned, which comes from tanneries, chemical mills, oil refineries, paper mills, woolen mills, exhaust pipes, coal mines, washeries &c. This apparatus has been patented and rights of the patent have been turned over to the Commonwealth of Pennsylvania for its use insofar as the Commonwealth is concerned, the patentees desiring to make no financial gain from the people of Pennsylvania.

It is the idea of the Department to take up one water shed at a time, and when that water shed is thoroughly covered to take up another one until the entire State is covered. When a warden takes up a stream he visits every manufacturing plant on the stream and sends into the Department on a special report, data which shows just what the refuse consists of and the amount which is running into the stream daily, and such other information which will assist the Department in sending out the prints of the apparatus. After the data is received by the Department from its field men, the necessary prints are compiled by the clerks and sent to the manufacturer who is running the refuse into the stream. With each print the Department sends a letter explaining to the manufacturer or mine owner, that he is violating the Act of May 1, 1909, and recommending

to him this system of filtration, advising him in the same letter that the patentees, by proper action, have permitted the construction and use of this apparatus by all firms and persons using the same in Pennsylvania, and that it may be constructed and used without any charges, royalties, or other payments other than the actual cost of construction. The Department makes no suggestion in reference to the cost of construction. The construction of the apparatus to be done entirely by the company, subject to the approval of the Commissioner of Fisheries. When this report goes to print the Department will be actively engaged in a vigorous campaign throughout the State on the pollution of streams, and expects by the time Spring arrives to have the entire State covered, at which time the weather will be sufficiently mild to allow the construction of this apparatus by the manufacturer or mine owner.

The Commissioner is so much interested in the work of clarifying the streams that he paid out of his own pockets the fee for the securing of the patent on this apparatus and in turn turned over to the Commonwealth of Pennsylvania the rights of the patent so that the manufacturers and mine owners in Pennsylvania would get the benefit of this system without being compelled to pay any royalty for its use.

Patentees Claim.

1. A filtering apparatus, comprising a series of tanks separated by detachable hollow partitions, one wall of each partition having inlets adjacent its lower end, and the opposite wall having outlets adjacent its upper end.

2. A filtering apparatus, comprising a series of communicating tanks formed by spaced detachably mounted hollow partitions and the series of filtering chambers arranged in tandem, said hollow partitions having openings adjacent their upper and lower edges communicating respectively with said tanks, two of the opposing walls of the filtering chamber being provided with shelves and a series of perforated supports arranged upon said shelves, filtering beds carried by said supports, one of said tanks being provided with an initial straining device, and one of said filtering chambers being provided with an outlet.

3. A filtering apparatus comprising a trough having a series of detachable hollow partitions forming a plurality of settling tanks and filtering chambers, said tanks and chambers being in communication with each other adjacent their upper and lower edges, the partitions forming the filtering chambers being stepped, a series of superposed supports mounted upon said steps, and a series of superposed filtering beds arranged upon said supports.

4. A filtering apparatus, comprising a trough having a series of detachable hollow partitions forming a plurality of settling tanks, and a series of staggeredly arranged partitions forming filtering chambers, said hollow partitions being provided with openings ad-

jacent their top and bottom communicating with the respective tanks, the other partitions of said trough forming zigzag passages for conveying the fluid upwardly through the superposed filtering beds.

5. A filtering apparatus comprising a trough having spaced vertically disposed cleats, secured to the inner face of the walls thereof, hollow partitions having their ends arranged over said cleats, the walls of said partitions being provided with spaced openings in different horizontal planes, and a series of filtering chambers arranged in line with said trough and communicating therewith, said filtering chambers carrying superposed, foraminated supports, each support having a filtering bed mounted thereon.

6. A filtering apparatus comprising a trough provided with a plurality of oppositely disposed cleats secured to the walls thereof hollow partitions slidably mounted upon said cleats forming a series of settling tanks, said partitions being provided with openings in different horizontal planes communicating with said tanks, and a series of superposed filtering beds communicating with one of the series of said tanks.

This apparatus has been thoroughly tested and has proven to do the work for which it was designed throughly. Many severe and practical tests have been made and its practicability is known.

The Twentieth Annual Meeting of the Pennsylvania Water Works Association was held at Atlantic City, N. J., on October 20, 21, and 22d. The Commissioner of Fisheries delivered an address on the subject "Extent to which Pollution of Streams by Mining and Industrial Operations may be Prevented." The address follows:

"Mr. Chairman and Members of the Pennsylvania Water Works Association:

When a Commissioner of Fisheries is called upon to address an audience like this he feels in the company exemplified by the poet:

"Two minds with but a single thought
Two hearts that beat as one."

because the success of all concerned depends on one thing, that is pure water.

The subject of my address "Extent to which Pollution of Streams by Mining and Industrial Operations may be Prevented" is one of vast importance to the Pennsylvania Department of Fisheries and is the greatest problem the Department has to face. Manufacturers and coal mines in infinite numbers, cities, towns, hamlets and even farm houses have been using the streams as cheap sewers to carry away the refuse that anybody saw fit to put into them. Such use of the streams is in absolute defiance to the best law, "Do unto your neighbor as you would have him do unto you." But the fellow up stream did not care anything for the feelings of the man below, but his own feelings got badly hurt when one on the stream above him did the same thing to him as he was doing to the fellow below.

Pollution of the streams has been getting worse and worse as the population increased and manufacturers and towns grew along the streams. Pollution is a menace to public health and a destroyer of fish life in streams, so public sentiment forced the Legislature to enact laws prohibiting it. Under the provisions of the Act of May 1, 1909, the Department of Fisheries has the authority to compel mine owners and manufacturers to take the necessary steps which will prevent the refuse from their plants from getting into the streams and destroying fish life. For some time the Department of Fisheries has been calling the attention of the violators of the law to the absolute necessity of keeping clear the waters of the Commonwealth. The Department has been handicapped in its work along this line due to the fact that it never had any device which it could recommend to the polluters of the streams which it knew would take care of the refuse from their plants. Of course the law giving the Department the authority is on the statute books but when the manufacturers asked the Department to recommend to them a device for keeping the streams clear it was unable to do so. The Department found that in the majority of cases the manufacturers were willing to cooperate with it but there are other cases where it has been found that penalties had to be resorted to. Many were profuse in promises but slow in performance.

The Department has found that it was of no avail to take up cases here and there, and the course which it will follow in the future will be to take up one water shed at a time having its wardens visit every manufacturer or mine owner located along the stream who is allowing pollution to escape into the water. There is one way by which stream pollution can be done away with and that is by stopping the wheels of industry, but no sane person would expect the Department of Fisheries to resort to such a step.

During the past few years the Department has been working on a filter system and has tested it in every way and has found that it will absolutely purify the water to such an extent that fish will thrive and vegetation grow. This filter will take care of refuse from Mines, Refineries, Tanneries, Paper mills, Dye works and Chemical mills.

The mine filter was installed the early part of this year at the mines of the Maple Grove Coal Mining Company, located at Raymilton, Venango County, Pennsylvania, and it does the work to perfection. The water from this mine every year was turned into Sandy Creek, killing fish for a distance of fifteen or twenty miles. The acidity of the water being so strong that it killed everything it came in contact with. This coal company very readily agreed to install the filter system and it has proven that it will do the work and meet all requirements. After the filter was completed the company released the mine water which had been stored up for over a year and drained through the filter system between fifteen and twenty acres of mine water. At times there being an eight-inch stream of water. The water after going through the filter was turned into Sandy Creek and was so clear that none of the residents in that locality knew that it had been turned into the stream, while in other years as soon as the mine water was released complaints reached

the Department with the same old story, that thousands of fish were being killed by the company. The dimensions of the filter beds at this plant are as follows: Two compartments of lime stone, each measuring about three feet wide, three feet deep and three feet long. The approximate cost of this plant was \$90.00, \$50.00 for labor and lumber and about \$40.00 for a carload of lime stone. This amount of lime stone will last about one and one-half to two years. Vegetation in the stream below the point where the filter was installed has commenced to grow, of course this size filter would not do the work at a larger mine, the size of the filter depending upon the amount of water discharged from the mine.

The size of the filter for the refineries, tanneries, paper mills, &c., depends upon the capacity of the plant.

The Warren Chemical Products Company, located at Russelburg, Warren County, Pa., on the Conewago Creek has installed this filter. This Chemical Company manufactures gun cotton and is one of the largest companies in the western part of the State. There is much sulphuric acid in the products of this company which if it gets into the stream will destroy fish and everything it comes in contact with for many miles. The filter was installed about six months ago and is open for inspection at any time.

The Department is having blue prints made of this filter and when the drawings are received blue prints will be made and the pollution of streams will be given careful thought. The Department knows that this filter will do the work and has no hesitancy in recommending it. The Commissioner of Fisheries and Mr. J. P. Albert, one of the wardens of the Department, are having this filter patented and are now awaiting the letters from the Government. The patent rights insofar as their use in the Commonwealth of Pennsylvania is concerned will be turned over to the State of Pennsylvania by the patentees.

I believe that the question of pollution of streams by mining and industrial operations is solved and it is hoped that the next few years will show much improvement in the conditions of the streams.

When the blue prints are ready and any of the members of the Pennsylvania Water Works Association desire a copy of the blue prints, the Department will be only too glad to furnish them. It has on file at its office in Harrisburg letters from scores of manufacturers throughout the State who are waiting for the blue prints so that they may install this system. The Department also has letters from many States that are anxious to adopt this plant.

No State in the Union has lovelier streams and lakes than the Keystone State of Pennsylvania. The streams meander through the valleys and should be kept so pure that they would not only be a paradise for fish, but a source of water supply for the inhabitants who people the banks and the stock that graze upon the fields.

The Pennsylvania Department of Fisheries trusts that it will receive the co-operation and assistance from everyone who is interested in securing purer water in which the fish can thrive and multiply, and which when pure will be a credit to this great Commonwealth and will be the means of attracting visitors to come to Pennsylvania.

I expected before coming here to have blue prints prepared so as to fully describe the workings of this filter system but was unable to do so and will describe them.

MINE FILTER.

Nothing but limestone is used. The water filters upwards. First chamber large box; water drops over and comes up through limestone and repeats itself; then flows into mixer at end of filter.

REFINERIES.

Size depends on capacity of plant. The refuse enters into first compartment, flowing into a breaker which is for the purpose of quieting the water. It then passes on into the next compartment, allowing the oil to separate from the water. The refuse passes through several compartments until it reaches the neutralizing or clarifying beds and then into the stream. First compartment consists of, bottom layer of limestone, second layer of charcoal, third layer of sifted sinders and coke, and fourth layer of spent fullers earth. Second compartment consists of, bottom layer of limestone, second layer of gravel, third layer of cinders, fourth layer of charcoal and fifth layer of sand. The thickness of layers depends on size of plant and amount to be treated. 12-inch air chamber between each layer.

TANNERIES, PAPER MILLS.

If the lime, tannic acid, sulphuric acid and salt water is separated the installation of the filter will be economical and will do away with the black inky water. This separation can be made at a cost of about \$100.00 by having a separate pipe for each ingredient. The entire refuse can be treated by having a larger filter at a greater cost. First compartment consists of, fifty foot square sludge box which catches all refuse, hair, fleshing, lime—used as fertilizer if run through separate filter. If one large filter is used the refuse is used as fuel. The tannic acid and lime when mixed forms the inky black water. Separate filter for each ingredient eliminates this. Second compartment consists of settling basins—200 feet long; 50 feet wide and 30 feet deep. The refuse overflows through 30 feet of limestone, 4 feet deep, neutralizing acid. This process is then repeated. It then flows into clarifying beds consisting of, layers of cinders 4 feet deep, fullers earth 4 feet deep, charcoal 4 feet deep, gravel 4 feet deep and sand 4 feet deep. The water filters upwards, size of filter depending on capacity of plant and amount of refuse to be treated. Between each layer of cinders, fullers earth, charcoal, gravel and sand, there is an eighteen-inch air chamber.

By Mr. ———.

May I ask Mr. Buller whether the filter plant he talks about has ever been used in the anthracite operations, and if so if difficulty was experienced in handling the silt?

By Mr. Buller.

Not at any mine. There has been anthracite mine water run through, but the silt as you are speaking of in my estimation could

very well be taken care of in a sedimentation bed before the water enters the filter. In the anthracite mine regions today I don't believe there would be any trouble about the sedimentation bed, because it has been found by the anthracite mine operator that there is nothing to go to waste around a mine as it did years ago because they find that silt is valuable too and a great many of the mines now are building sedimentations now of that kind. The only question in the anthracite mines is as the volume of water increases.

Mr. Hawley, of Wilkinsburg.

I suggest that if Mr. Buller would furnish the Secretary with blue prints we would have electrotypes made and cuts could be printed with the paper when it appears in our proceedings.

By Secretary Purviance.

May I ask Mr. Buller whether this hasn't appeared in a magazine in Pittsburgh and couldn't plates be gotten of it there?

By Mr. Buller.

That was just a photograph of one. I will be very glad to furnish the Secretary with the blue prints and cuts as soon as they are received, and each separate device with an explanation; in fact to any company I would gladly furnish the blue prints.

By Mr. Ahrens, of Reading.

Have you tried that experiment at dye works?

By Mr. Buller.

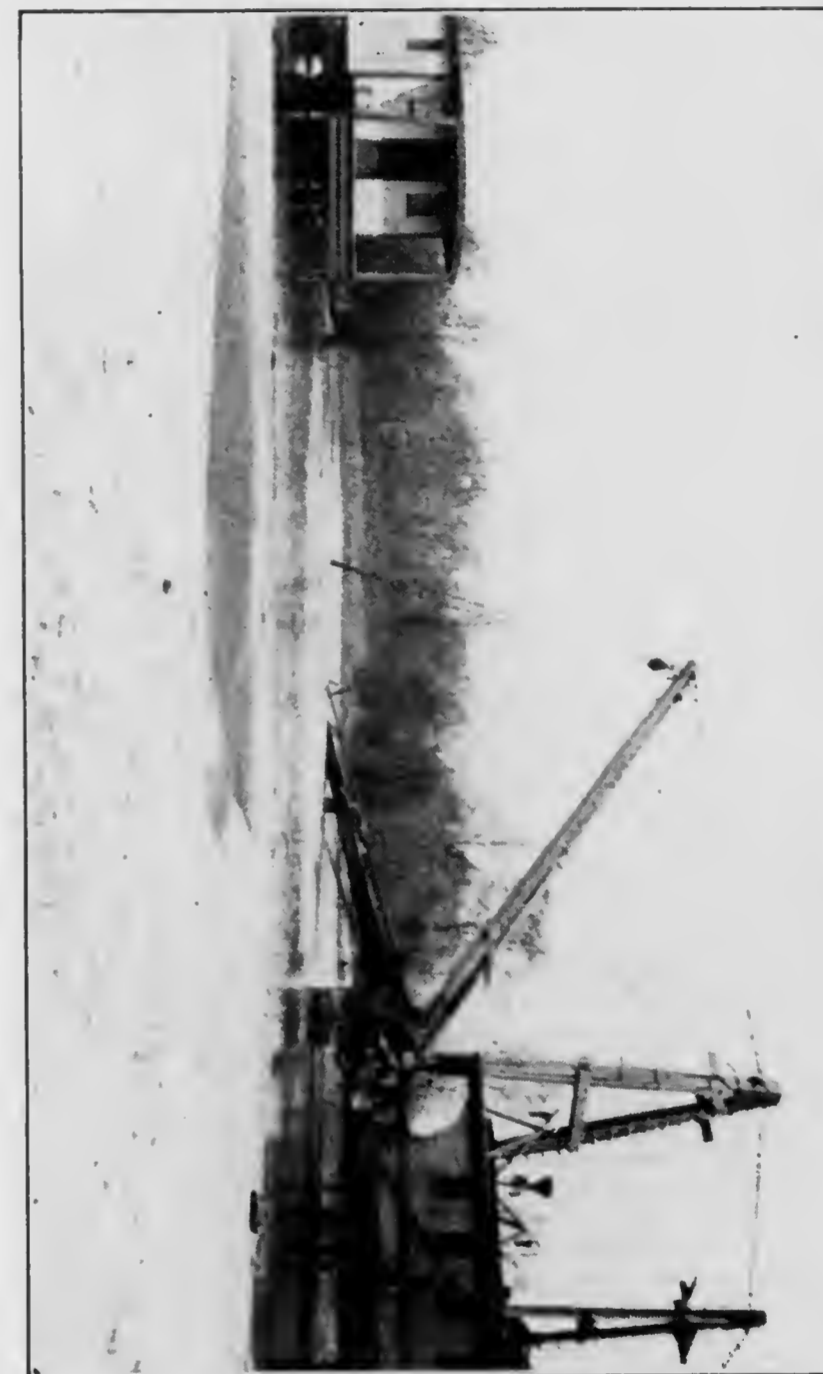
Yes, sir, that is the worst proposition we have to handle. We have about 90 per cent. improvement, so that is doing pretty well. We may get the other ten per cent.

I thank you for your attention.

PRESQUE ISLE PENINSULA.

In the Spring of 1914 a contract was awarded to the T. A. Gillespie Company, of Pittsburgh, Pa., to do the work of dredging out the channels and ponds in the Peninsula in order that the natural spawning grounds for the fish might be restored to their natural state. The Session of 1913 appropriated for this work \$20,000. The Department was able to make considerable headway with this amount of money, and would at this time be able to make a much better report of this work if the Session of 1915 had appropriated a like sum. This would have permitted the Department to continue with its work in an energetic manner, but the Legislature of 1915 appro-

Dredging ponds in Presque Isle Peninsula.



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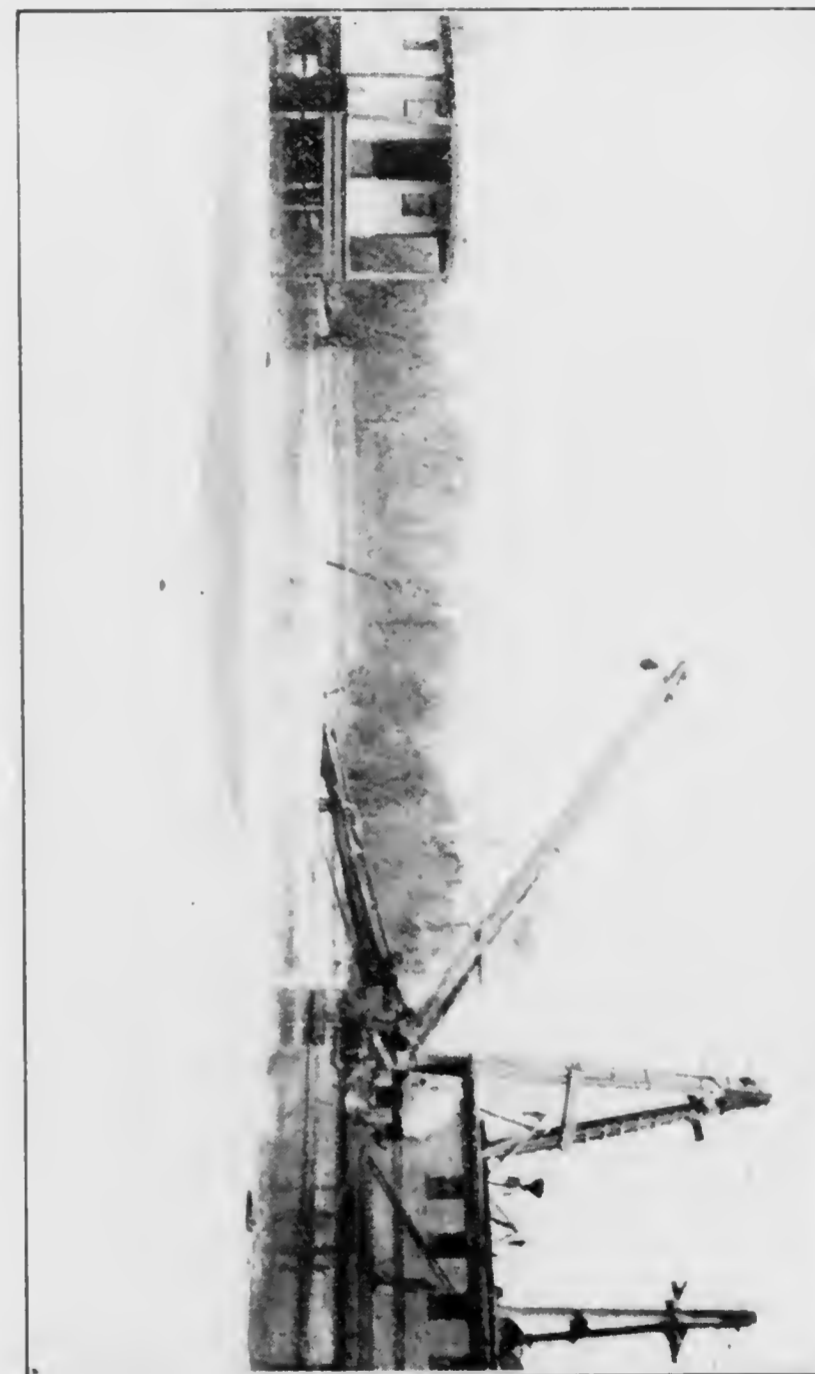
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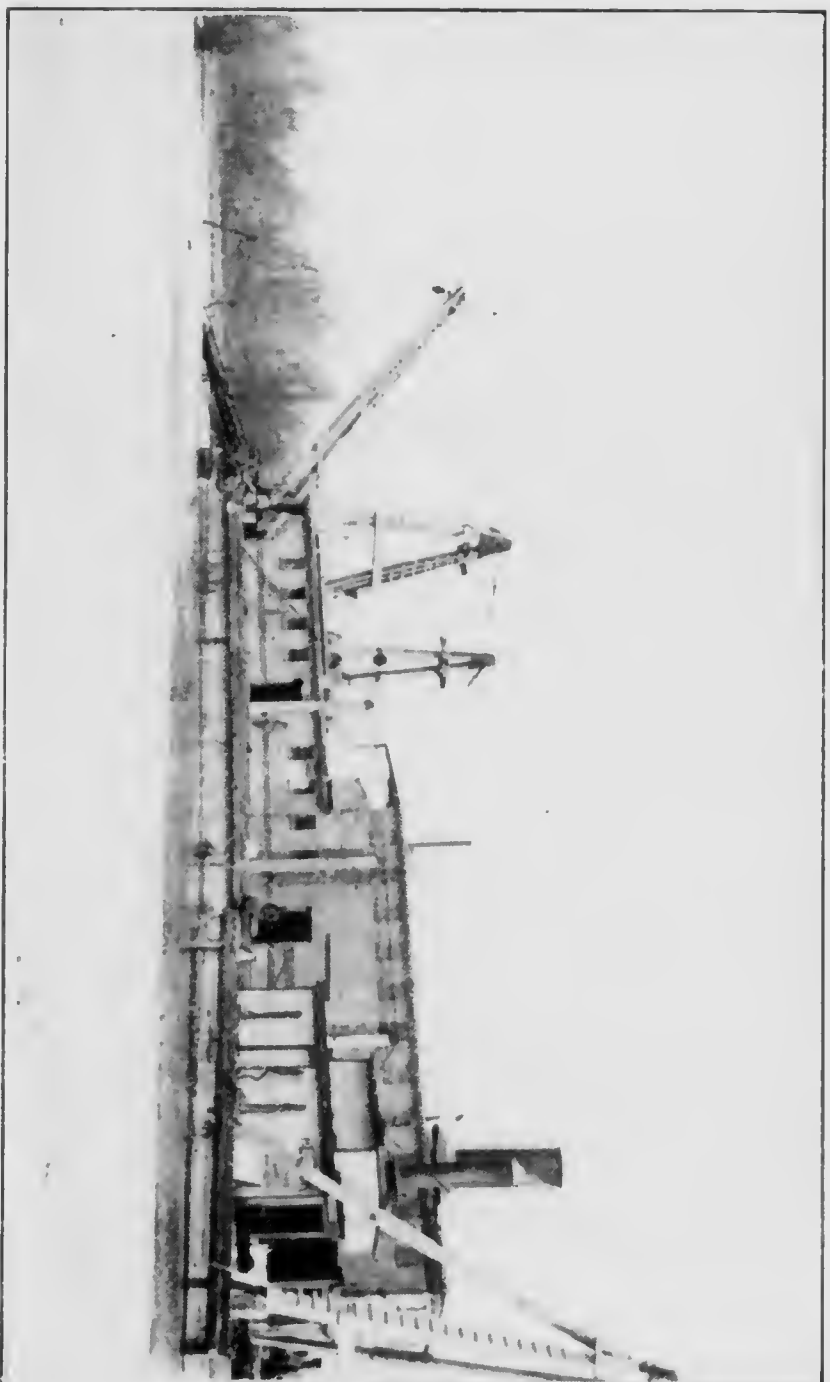
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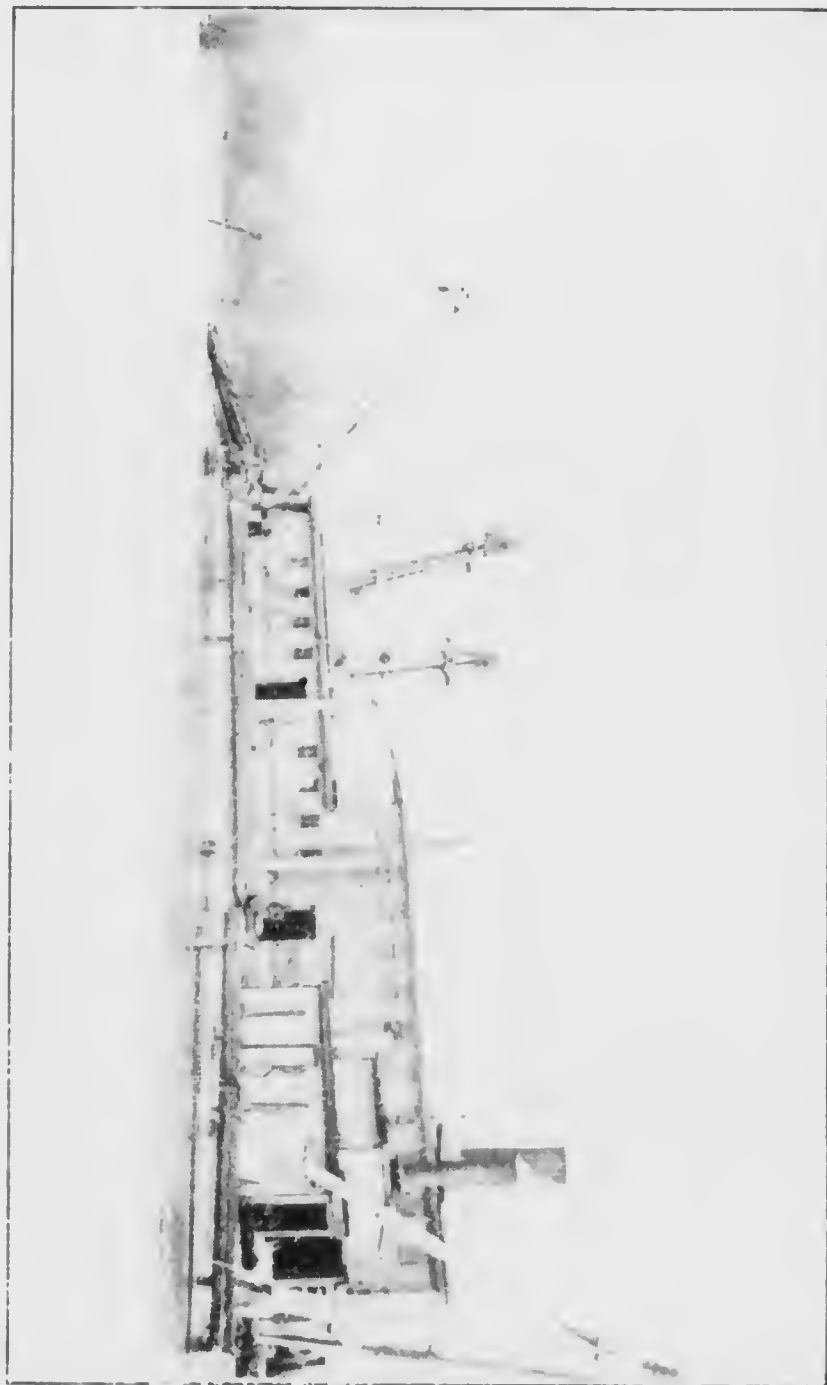
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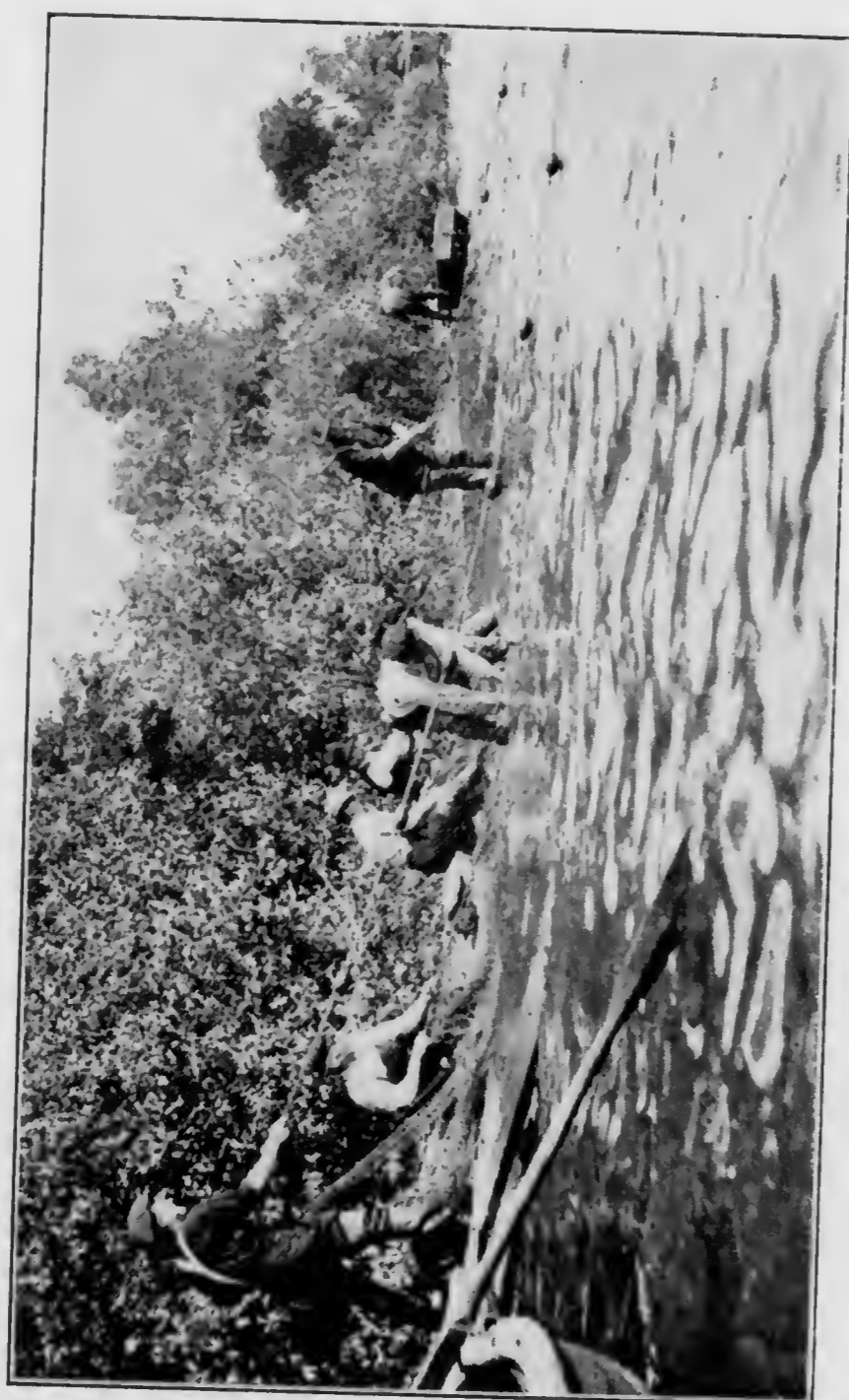


Dredging in Presque Isle Peninsula.



Deelizing in Presque Isle Peninsula.

INTENTIONAL 2ND EXPOSURE



Seining for fish in Presque Isle bay.

priated the small sum of \$8,000. With this small amount of money the Department could not do much work in continuing the dredging of the channels and ponds, but it is much pleased with the work which was done by the T. A. Gillespie Company. The dredge was able to work five days in May, the months of July and August, and seventeen days in the month of September, making a total of 84 days which it worked. During this time there were excavated 107,567 cubic yards of earth. On September 17th the Department was compelled to stop the work on account of lack of funds.

The work of restoring the natural spawning grounds in Presque Isle Peninsula is of much importance, not only to the Department of Fisheries, but to the people of Erie, and the people of the entire Commonwealth. When this work is completed the Department will have a very valuable field to work upon and will mean much in the distribution of fish in the waters of the Commonwealth of such species which the Department is unable to propagate artificially at its hatcheries. In order to finish the work which is started the Department will have to receive larger appropriations from the Legislature, and the Legislature ought to realize the importance of this work to the people of this Commonwealth. When this work is completed there will be three hundred acres of pond area.

It has been a surprise to many the amount of work accomplished by the Department in opening the water courses in the Peninsula, and much credit is due to the dredgers working on the Peninsula.

FISHWAY AT McCALL'S FERRY DAM.

The Department of Fisheries is putting forth every effort to meet the requirements at McCall's Ferry Dam and has given the question of the erection of an adequate fishway at this point its most serious thought.

Today there is no practical and successful fishway known. This is the consensus of opinion of fish culturists throughout the world. The advancement made by the Pennsylvania Department of Fisheries is attracting much attention from outside States, as well as from some of the foreign countries, and they are all waiting for Pennsylvania to work out a practical fishway. It is a question in the mind of the Commissioner of Fisheries after giving it much thought and gathering much data and statistics, and taking into consideration the many conditions to be met at this point, whether a practical and adequate fishway can be constructed for the ascension of the shad up the Susquehanna River. Both the Department of Fisheries and the Pennsylvania Water & Power Company will welcome a practical demonstration from anyone of an adequate fishway for the ascension of the shad, but it must be a practical demonstration with no cost to the Commonwealth of Pennsylvania or the Power Company.



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There has been much correspondence on this subject and a very complete report has been compiled by the Power Company which contains valuable data, and which the Department submits herewith for the benefit of the public as it believes the public in general are not familiar with the conditions which are to be met at the McCall's Ferry Dam.

June 25, 1915.

"Hon. Francis Shunk Brown,
Attorney General,
Harrisburg, Pa.

Dear Sir: The Department received the following letter from His Excellency, the Governor, on May 17th:

"May 17, 1915.

Honorable N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pennsylvania.

My dear Sir: I wish you would personally or through some competent agent make a study at once of the shad fishery situation at McCall's Ferry Dam, and if that Dam is impeding the progress of fish up the Susquehanna river and there is any law in this Commonwealth that will open the way for those fish, I want you to put it in operation after conference with the Attorney General at once.

Very truly yours,
M. G. BRUMBAUGH."

On May 17th the Department wrote the Governor as follows in answer to his letter:

"May 17, 1915.

Honorable M. G. Brumbaugh,
Governor of Pennsylvania,
Harrisburg, Pa.

Sir: I have the honor to acknowledge receipt of your communication of the 17th instant with reference to making a study of the shad situation at McCall's Ferry Dam and beg to advise you that ever since my incumbency in office this has been one of the most serious problems confronting me. I have made extensive investigations, bringing this matter to the attention of fish culturists all over the United States and it is the consensus of opinion among them that there has not yet been a fishway designed or built which will permit the ascension of the shad. I have been studying this matter very seriously and assure you that my best efforts will be put forth to open the way for the shad.

I will consult with the Attorney General and place before him all correspondence and data which the Department has on this subject and will be guided by his advice.

Respectfully,

(Signed) N. R. BULLER,
Commissioner."

On account of the Legislature being in session and the Department knowing that you were extremely busy, it did not take this matter up earlier thinking it best to wait until the adjournment of the Legislature.

During the term of Hon. Hampton L. Carson, Attorney General for the Commonwealth, the question of the erection of the dam at McCall's Ferry was taken up and the court proceedings are on file in your office under the following:

- In the Court of Common Pleas of Dauphin County, Docket 1906.
Commonwealth of Pennsylvania Ex Relatione Hampton L. Carson, Attorney General, vs.
Susquehanna Canal and Power Company.
Suggestion for Writ of Quo Warranto.

In the Court of Common Pleas of Dauphin County.
Sitting in Equity.

The Commonwealth of Pennsylvania, Plaintiff, vs.
McCall's Ferry Power Company, Susquehanna Canal and Power Company, Susquehanna and Tidewater Railroad Company.

On January 14, 1907, the following portion of the decree in re McCall's Ferry Dam that applies to the placing of a fishway therein provides:

"And now, this 14th day of January, 1907, the above cause having come on to be heard upon bill and answer and having been argued by counsel, it is ordered and decreed that the right of the defendant, the McCall Ferry Power Co., to continue the construction of a dam now in course of erection on the Susquehanna river and to maintain said dam after the same shall have been constructed, shall be subject to its making and maintaining adequate provision for the passage of fish," etc.

Following this by orders of the former Board of Fishery Commissioners there was directed to be placed in the dam at McCall's Ferry a Cail fishway. This fishway was built according to the plan submitted by the Department and afterwards approved by the former board of Fishery Commission. After this Cail fishway was built it was found that it was not practical as the shad would not ascend it, and this fishway was practically useless.

When I assumed the duties of this Department in September, 1911, this question was brought to my attention and numerous meetings with the officers of the Pennsylvania Water & Power Company were held, and after receiving all the data possible on the question, bringing the matter up for discussion before a meeting of the American Fisheries Society, being composed of fish culturists from all over the world, it was the consensus of opinion of all present that there was no practical fishway in use.

The Department carefully studied this matter and directed the Power Company to place a fishway in the McCall's Ferry Dam trying to imitate the natural riffles in the river. This the Power Company

very readily agreed to do and at this writing the Company is still working on this fishway and making improvements, and the Department has found this Company ready at all times to meet the demands made more than half way. I hand you herewith report made in 1915 by the Power Company, and after it has served your purpose would request that you return it to me as it is the only copy I have.

In the year 1913 there was a joint resolution approved requiring the construction of an adequate fishway in the dam constructed across the Susquehanna river by the McCall's Ferry Power Company, now the Pennsylvania Water & Power Company at McCall's Ferry, providing how and when and by whom such fishway shall be constructed and providing penalties for failure to comply with the terms of this resolution. You will find this joint resolution on page 112 of the Pamphlet Laws of 1913.

This is a very serious problem which faces the Department and it has studied the question from all angles and is doing everything possible to find some fishway which can be built and which will allow the shad to ascend the river and is at present working on the plan as approved by the Board of Fishery Commission.

Many plans have been submitted to the Department but none of the parties are willing to make a demonstration of their proposed fishway. This Department is glad to receive suggestions and the Pennsylvania Water & Power Company is ready at any time to take the matter up further with any one who can show a satisfactory fishway, and the Company would reimburse the parties should the fishway after a practical demonstration prove satisfactory.

The shad is a very sensitive fish and will not jump out of the water or pass under any overhead obstruction when the sun is shining which would cause a shadow. This makes the erection of a fishway very difficult. There are conditions to be met at McCall's Ferry Dam which make it very difficult to erect a fishway, which in times of high water must be made to meet all the forces of Niagara and in times of low water must allow sufficient water to run through the fishway so that the fish will not become stranded.

It is needless to say that any mechanical device is entirely out of the question, but it is hoped that a satisfactory fishway can be built which will allow the ascension of the shad. The Department assures you that everything possible is being done with this end in view and awaits your advice in this matter.

Very truly yours,

(Signed) N. R. BULLER.
Commissioner.

Office of the Attorney General,
Harrisburg, Pa., Jan. 31, 1912.

N. R. Buller, Esq.,
Commissioner of Fisheries,
Harrisburg, Pa.

Dear Sir: Responding to your request of the 30th, I subjoin the portion of the decree in re McCall's Ferry Dam that applies to the placing of a fishway therein:

"And now, this 14th day of January, 1907, the above cause having come to be heard upon bill and answer and having been argued by counsel, it is ordered and decreed that the right of the defendant, the McCall Ferry Power Co., to continue the construction of a dam now in course of erection on the Susquehanna river and to maintain said dam after the same shall have been constructed, shall be subject to its making and maintaining adequate provision for the passage of fish," etc.

The remainder of the decree refers to the construction of a proper lock or locks in order to make the navigation of the river continuous.

Very truly yours,

(Signed) H. M. HOKE,
Private Secretary.

York, Pa., August 9, 1915.

Hon. Francis Shunk Brown,
Attorney General,
Harrisburg, Pa.

My dear General: About a week ago I called at the Department of Fisheries to make inquiry concerning the progress the Pennsylvania Water and Power Company was making toward the completion of the fishway. I was informed that the whole matter was laid before your Department for the purpose of investigation of the premises and coercion on the part of your Department in the event said Department finds that the Pennsylvania Water and Power Company has been derelict in its duty toward the people of Pennsylvania in failing to construct an adequate fishway.

I have taken a very decided interest in this matter. As a member of the 1913 Legislature I introduced a resolution to compel the aforesaid Company to construct an adequate fishway, which resolution became a law, as you no doubt are aware. It was not our purpose in passing this resolution to harass or compromise this power company. It was our purpose to compel this company to give back to the

people of Pennsylvania a well defined right that which was filched from them by this company at the time they constructed their dam, notwithstanding the decree of the Dauphin County Court upon an injunction proceeding brought against this company while their dam was in course of construction.

I feel that it is high time that your Department take action and I believe you will find, upon investigation of the law and facts in the case, that you have ample authority to proceed against this company. Unless the Pennsylvania Water and Power Company install an adequate fishway, their failure will spell ruin to the fish industry in the Susquehanna river, which has been one of the most prolific streams for shad industry in the country prior to the erection of this great dam, which was constructed without adequate provision for the free passage of fish.

The people of York county are thoroughly aroused as a result of the confiscation of their rights and the destruction of the great industry that was a source of great profit to hundred of fishermen engaged in the business in York and Lancaster counties.

I trust you will take this matter up with your characteristic vigor and energy and push it to a successful conclusion. I shall greatly appreciate hearing from you concerning the matter. With kind regards, I am

Very truly yours,

ROBERT S. SPANGLER.

August 19, 1915.

Hon. Robert S. Spangler,
York, Pa.

Dear Sir: Your favor of the 9th inst. with reference to the fishway around the dam of the Pennsylvania Water and Power Company at McCall's Ferry, was duly received.

I enclose for your information copy of the letter which the Commissioner of Fisheries sent to this Department on June 25, 1915, accompanying it with a series of photographs showing the conditions surrounding the building of the fishway, the difficulties encountered and the progress of the work made up to that time.

You will notice from the letter of the Commissioner of Fisheries that he says there was a Cail fishway built according to plans submitted to, and approved by, the old Fisheries Commission, which fishway was practically useless, and that since the present Commissioner assumed the duties of his office in September, 1911, this has been one of the most serious matters which has confronted him; that he has brought the matter up for discussion before the American Fisheries Society, composed of fish culturists from all over the world; that the Pennsylvania Water and Power Company seem

willing to put in any fishway which is practicable; that many suggestions have been made to the Department of Fisheries, but that none of these suggestions had been accompanied by offers to submit a practical demonstration of the proposed fishway.

I gather from the letter of the Commissioner of Fisheries that he is doubtful whether the present fishway, when completed, will be found practicable, and that he is still searching for some satisfactory plan for a practical fishway.

The decree of the Court of Common Pleas of Dauphin County which permitted the construction of this dam, provided that the same "shall be subject to its making and maintaining adequate provision for the passage of the fish." If ultimately it be found that there is no practical fishway, then the Commonwealth of Pennsylvania, acting through the Attorney General, must determine what action should be taken in the premises, but in view of the fact that millions of dollars have been spent in the construction of the plant, including the building of the dam, under color of the decree of the Court of Common Pleas of Dauphin County, I am of the opinion that every reasonable opportunity should be given to the company to construct and perfect a fishway before considering the question of the failure of "making and maintaining adequate provision for the passage of fish," as provided in the decree of the Court.

I am advised by the Commissioner of Fisheries that substantial progress is being made toward the completion of the present plans.

I am taking the liberty of sending a copy of this letter to the Commissioner of Fisheries, and also to the Pennsylvania Water and Power Company, together with a copy of your letter to me.

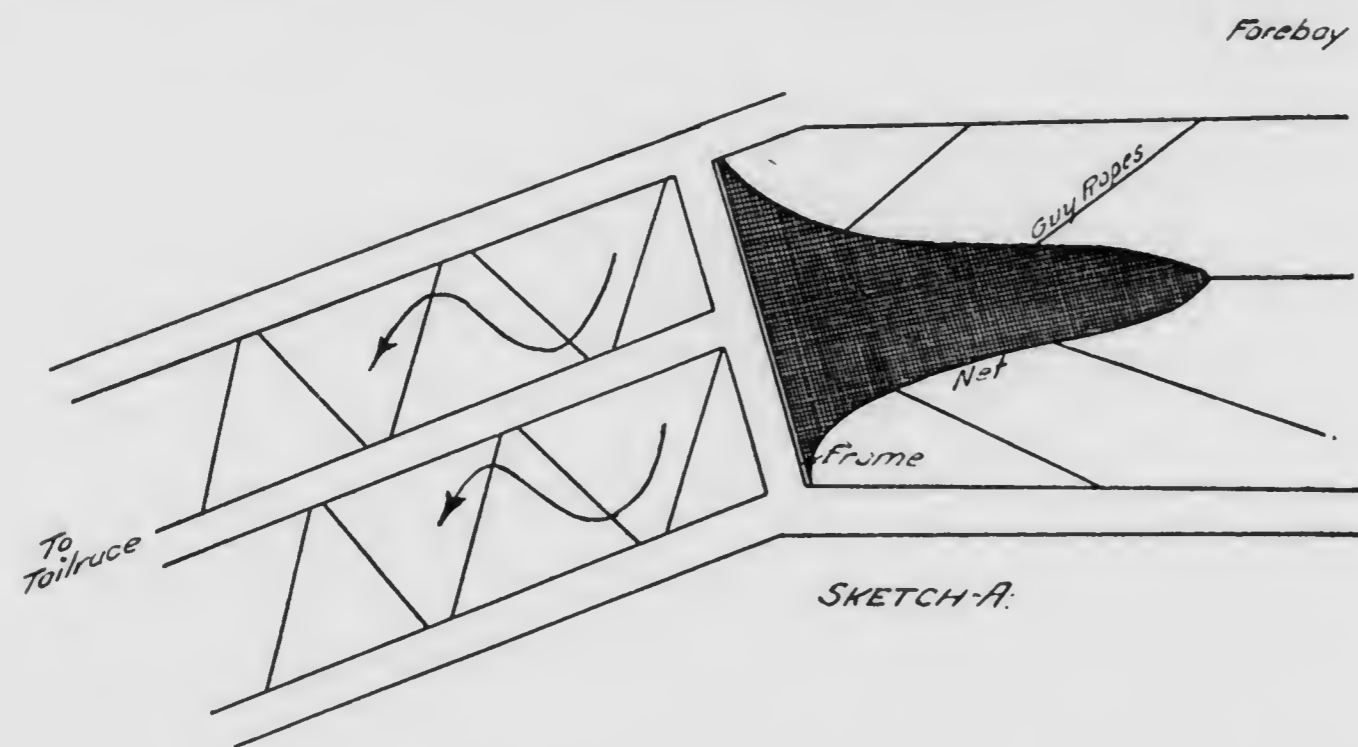
Very truly yours,

ATTORNEY GENERAL.

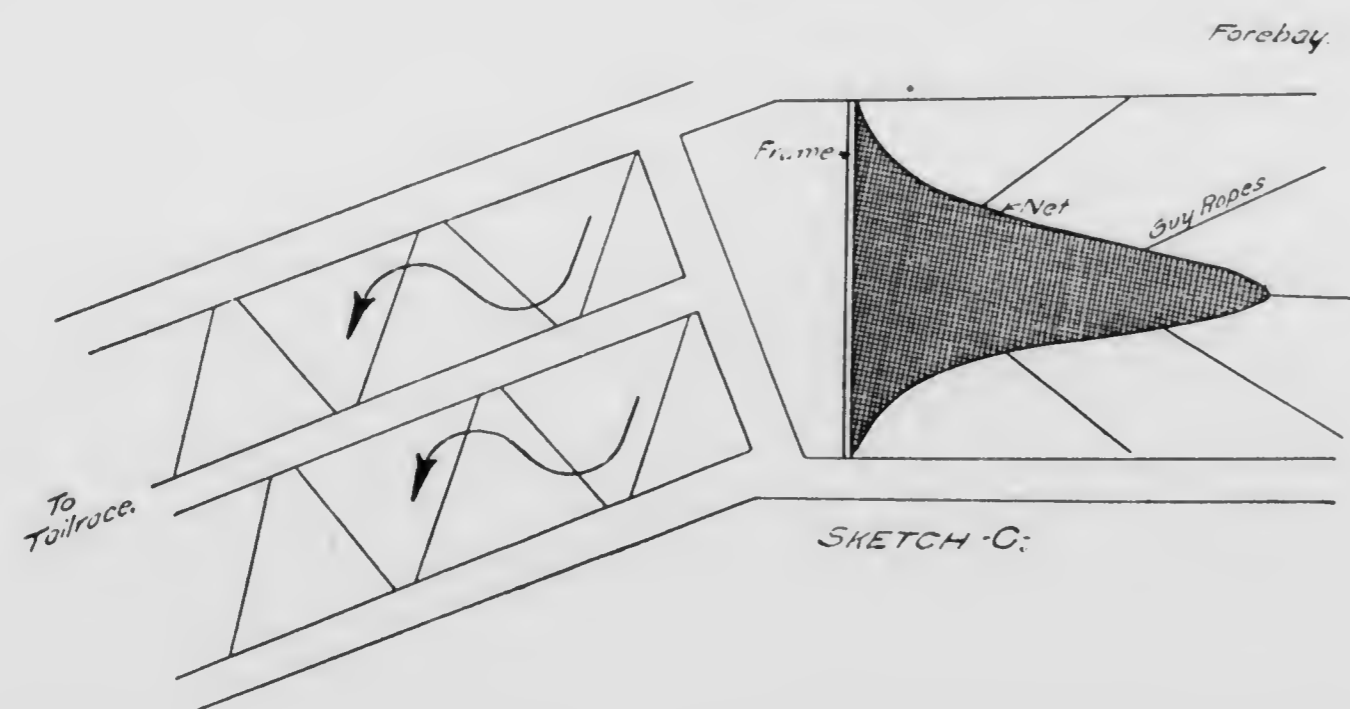
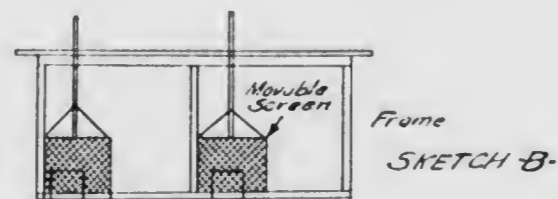
OBSERVATIONS AND EXPERIMENTS LANCASTER COUNTY
FISHWAY OF PENNA. WATER & POWER CO.,
HOLTWOOD, PA.

These observations and experiments were made during the spring of 1913 at the request of and in co-operation with the U. S. Bureau of Fisheries, represented by Mr. J. J. Glennan, Superintendent of the government station at Havre de Grace, Md. The object of work was to observe as far as possible, the ability of the different varieties to make their way up the fishway.

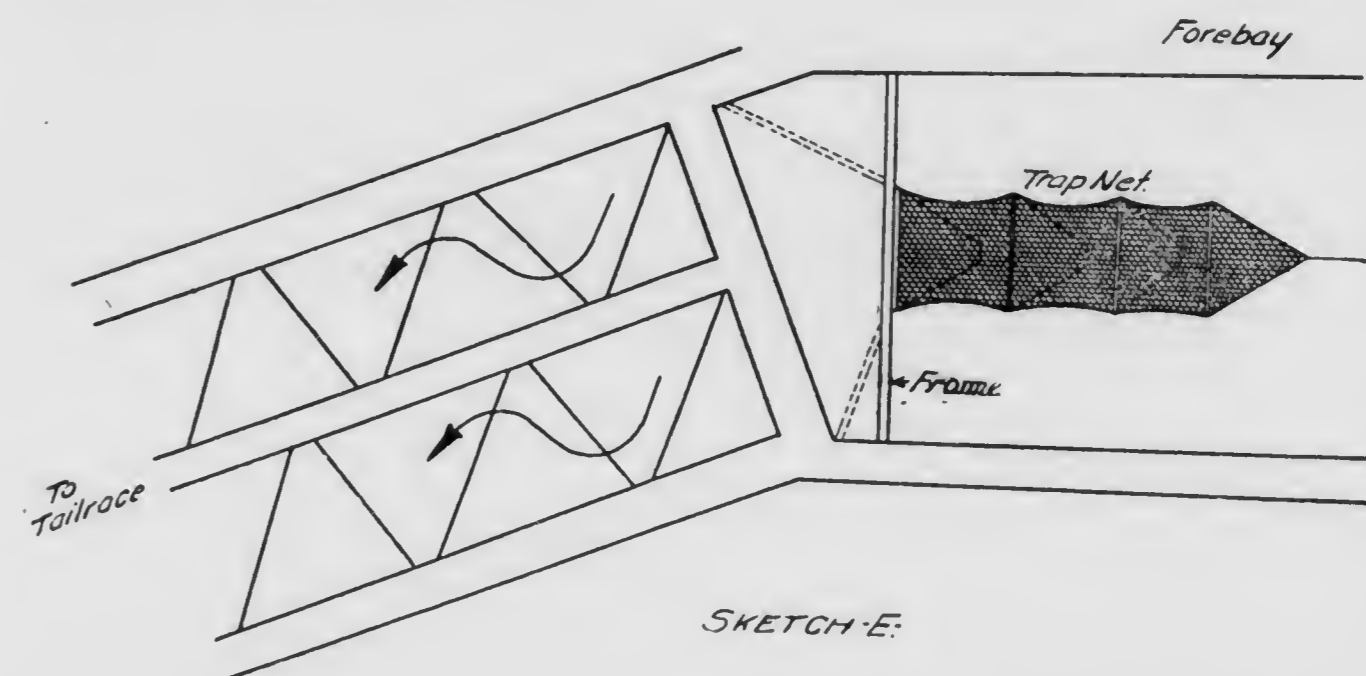
The observations were conducted as follows: A net was arranged as requested by Mr. Glennan and as shown in the sketch A.



This net was placed in the fishway on 4/24/13, and the frame to which the net was attached was placed directly against the top openings of the fishway ladder. This frame as seen from sketch B partly closed the openings and therefore to give a better approach this frame was moved back, on 4/28/13 about four feet from the openings as shown in sketch C.



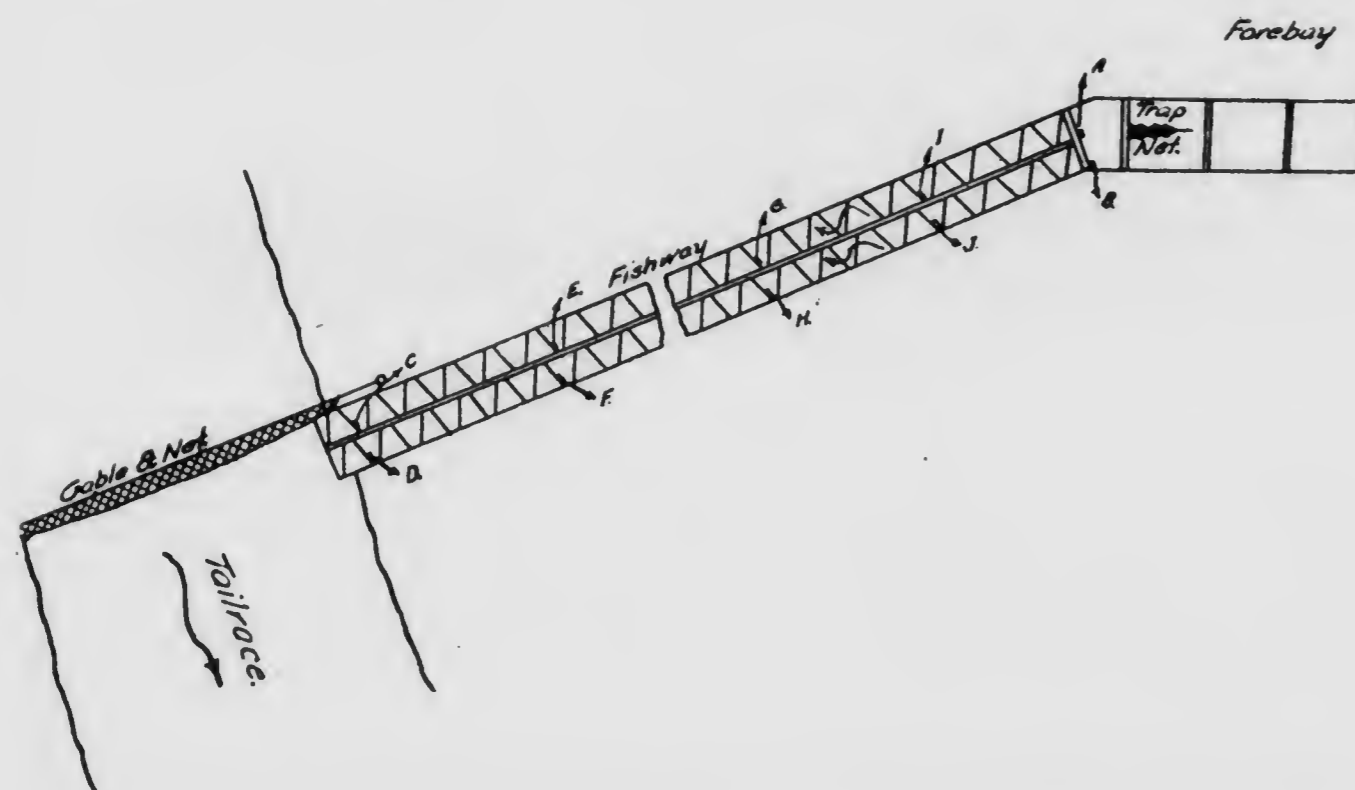
On 5/3/13 the net as shown in sketch C was replaced by a trap net as shown in sketch E.



The advantage of this net was that a fish once inside of the net could not get out, whereas in the other net it was possible for a fish to come up as far as the net and then to recede back through the fishway into the tailrace. This trap net was kept in this position throughout the rest of the experiments and from the tabulated observations, it is clearly seen that this trap net was far superior than the other net for the experiments, as all the fish caught in a net were found in the trap net, thus tending to show that while the net as in sketch C was in operation, some fish had climbed the ladder and then finding the net as an obstruction to go farther ahead, had then receded back through the fishway.

There was, however, one drawback to the trap net, and that was that it was not large enough. It would have been better if the trap net had covered the entire width as had the other net. As in the sketch E, the trap net was placed in the center of the fishway on the frame and on the sides of the frame, a poultry wire was placed, so as not to allow the fish when going up, to get by the net, and not to allow them to come from above and then around and into the net. The total width of the fishway is 21.8' and the width of the trap net was about 4 to 5', and the other space was taken up by the poultry wire and as the current of water was practically the same across the entire width of the fishway, it made the approach of the trap net rather poor. The approach of the trap net could have been made better if the frame had been slanted to the opening of the trap net as shown by the dotted lines in sketch E.

Method of making a haul:



At first the method of making a haul was as follows: 1st—Screen was placed at A, B, C and D. This screen was placed over the openings so as not to allow the fish to pass through. Then the gates at the head of the fishway were closed, thereby shutting off the water. The water was then allowed to drain out of the fishway, and then, an inspection was made in the net and throughout the fishway. However, it was not possible when fish were found at C and D to determine how far up they might have been, so later on in the experiments screens were also placed at points E, F, G, H, I and J. Then when fish were found at, for instance, G, it was known that they had been between G and I, but are tabulated as being found at G.

On 5/6/13 a net was stretched across the tailrace, this consisted of an iron cable with poultry wire suspended on it; to a depth of 12 feet, the poultry wire being weighted at the bottom. The cable was placed as in sketch F, just a little above the fishway, across the tailrace. This gave a decided improvement as shown from the tabulated observations. This net across the tailrace did not act to its best advantage because it was difficult to weight it down, that is, to keep it in a vertical plane. The current in the tailrace being rather strong, especially during heavy loads and would tend to sweep the net out so at times it was nearly in a horizontal plane, and thereby putting the net partly across the opening of the fishway and tending to deflect the fish back through the tailrace.

On 5/23/13 the water was rather low in the tailrace and when the water was allowed to drain out of the fishway, it was noticed that the two bottom compartments were nearly half filled with dirt and large and small rocks, and thereby nearly closing the openings of the pockets. This had not been noticed before as the water had not, during the experiments, receded in the fishway to show up these

bottom pockets before. The fishway here was made in a cut and this dirt and stones had washed down from the sides above the fishway. When those bottom pockets were cleaned, the most appreciable difference was seen in the experiments, as nearly every day, afterwards, fish were caught in the fishway.

In summing up the facts from the observations, we come to the conclusion, namely, that the experiments had started off rather poorly, due to the fact that the conditions under which the fishway experiments were being operated were not good. It is also noticed, however, that the results were very much better towards the end of the experiment, when improvements had been made. For instance, from 4/28/13 to 6/14/13, or a period of 58 days 10 fish were caught in the net and 56 in the fishway. And from 5/23/13 to 6/14/13, or for a period of 25 days, eight fish were caught in the net and 49 in the fishway. Thus showing that from 5/23/13 or the last day of an improvement in the experiments, the majority of fish were caught. It is also convincable that the tabulated observations do not show the best results, for example, fish caught in the fifth pocket might have been quite a bit farther up the fishway and being washed down when the water was shut off and being caught up against the screen placed in the fifth pocket. As noted in the report, if better approach had been given to the trap net, and the net across the tailrace had been fastened and weighted more securely and if the bottom pockets had been cleaned earlier in the experiments, there is no question but that better results would have been obtained.

Tabulated Observations.

No.	Date.	Time of Closing.	Number and Kind Noted.	Where Found.	Time of Opening.	Remarks.
1	4/28	1.30 A. M.	1 10" salmon,	3rd pocket,	6.00 P. M.	Alive
2	5/8	11.00 A. M.	1 6" sunfish,	In net A,	11.30 A. M.	Alive
3	5/9	4.00 P. M.	1 6" sunfish,	In net A,	4.45 P. M.	Alive } had
			1 18" carp,	4th pocket,		Alive } been
			1 24" carp,	4th pocket,		Alive } higher
4	5/17	3.30 P. M.	1 8" catfish,	In net A,	4.00 P. M.	Alive
5	5/21	4.30 P. M.	1 10" mullet,	Half way up, ...	5.15 P. M.	Alive
			1 8" salmon, .....	.....		Alive
6	5/23	4.30 P. M.	2 24" carp,	12th pocket,	6.00 P. M.	Alive
			1 12" salmon,	6th pocket,		Alive
			1 10" salmon,	6th pocket,		Alive
			1 6" sunfish,	6th pocket,		Alive
7	5/24	11.00 A. M.	8 24"-30" carp,	5th to 11th pockets,	11.30 A. M.	Alive
			4 10"-12" salmon, ...	6th to 11th pockets,		Alive
8	5/26	4.30 P. M.	1 20" carp,	5th pocket,	5.20 P. M.	Alive
			1 30" carp,	10th pocket,		Alive
			1 20" carp,	In net A,		Alive
			1 5" sunfish,	In net A,		Alive
9	5/27	9.30 A. M.	3 sunfish,	In net A,	9.55 A. M.	Alive
10	5/27	2.20 P. M.	2 7" bass,	5th pocket,	2.50 P. M.	Alive
11	6/1	3.00 P. M.	1 30" carp,	11th pocket,	4.40 P. M.	Alive
12	6/2	11.00 A. M.	Small eels,	5th pocket,	11.45 A. M.	Alive

Tabulated Observations—(Continued).

No.	Date.	Time of Closing.	Number and Kind Noted.	Where Found.	Time of Opening.	Remarks.
13	6/3	10.45 A. M.	1 30" carp, Small eels,	13th pocket, 7th pocket,	11.30 A. M.	Alive
14	6/3	4.30 P. M.	1 30" carp, Small eels,	6th pocket, 7th pocket,	5.15 P. M.	Alive Alive
15	6/4	10.45 A. M.	2 30" carp, Small eels,	11th pocket 7th pocket,	11.15 A. M.	Alive Alive
16	6/6	11.15 A. M.	1 10" salmon, 2 6" bass, 1 9" salmon, Small eels,	In net A, 8th pocket, 7th pocket, 7th pocket,	11.45 A. M.	Alive Alive Alive Alive
17	6/6	3.35 P. M.	1 carp, 1 salmon,	19th pocket, 6th pocket,	4.10 P. M.	Alive Alive
18	6/7	10.50 A. M.	1 carp, 3 carp, 1 catfish,	14th pocket, 6th pocket, In net A,	11.20 A. M.	Alive Alive Dead
19	6/7	3.30 P. M.	2 salmon, 2 black bass,	4th pocket, 4th pocket,	4.00 P. M.	Alive Alive
20	6/9	11.45 A. M.	1 16" carp,	25th pocket,	11.45 A. M.	Alive
21	6/10	11.00 A. M.	5 salmon,	7th pocket,	11.35 A. M.	Alive
22	6/10	4.30 P. M.	2 salmon,	6th pocket,	5.10 P. M.	Alive
23	6/11	11.00 A. M.	1 salmon,	6th pocket,	11.35 A. M.	Alive
24	6/12	11.30 A. M.	1 15" salmon,	5th pocket,	12.00 M.	Alive
25	6/14	11.00 A. M.	1 7" salmon,	In net A,	11.30 A. M.	Alive

Note.—There are 39 pockets in the length of the fishway running from average tailrace elevation 107.00 to the top. Pockets mentioned in this tabulation are numbered from tailrace water level up.

October 9, 1915.

APPENDIX TO FISHWAY REPORT—SUITABILITY OF THE DESIGN OF THE FISHWAY.

From time to time criticism has been advanced to the effect that the type of fishway adopted was radically wrong and could never be made operative and that fish would never go up such a fishway.

The new fishway, as designed by the present Fish Commissioner, Mr. N. R. Buller, is generally conceded to be far superior in design to the old fishway at the east end of the power house, and if it can be proven that fish have used the old fishway, there can be little doubt in the minds of those competent to judge that fish would find an easier passage up the new fishway.

Many of those who have criticised most vigorously are unaware that tests were made during the spring of 1913 by the U. S. Bureau of Fisheries on the old fishway, and that these tests proved the fishway to be used by salmon, sunfish, carp, catfish, mullet, bass, and

small eels. A copy of this report is attached. No similar investigation has as yet been made on the new type of fishway of Mr. Buller's design, but, just as in the past it was claimed that the fish would not use the old fishway, and as later on when the tests were made it was found that fish actually were using the fishway, equally so, we may expect that experiments if carried out, would show the new improved fishway to be passing fish from the lower to the upper level.

In the absence of net experiments to catch fish which may ascend the new fishway it is impossible definitely to prove that shad have ascended, but there seems to be good reason for assuming that it is possible for shad to ascend. In this connection there is appended affidavits made by three parties familiar with shad fishing who declare to have seen a shad in the water above the dam on August 24th, 1915. As would naturally be expected of a shad remaining in the river until that late, in the year (since shad do not eat in fresh water) the shad was dead. But, as the date upon which this shad was seen was so long after the close of the shad fishing season, it is quite out of reason to argue that this shad was caught alive below the dam and transferred to a point above the dam by any interested parties. It is much more reasonable to assume that the shad ascended the fishway and made its way far up the river to spawn and returning died and floated to the point near the power house where it was seen, its death having occurred so recently that there were no evidences of decay.

All of this is brought forward as indicating:

1st. That we know that many kinds of fish ascended the old fishway.

2d. That as the new fishway is judged to be an improvement on the old one, it may be expected that it would be even more effective in passing fish.

3d. In the absence of actual net experiments to catch fish which ascend the fishway, and since fish ascending a fishway are very difficult to see, it is usual to jump to the wrong conclusion, that fish are not ascending the fishway.

4th. There is evidence that at least one shad has been seen above the dam and there is no reason for assuming that this shad could have been placed above the dam by any interested parties.

Dam Blamed for a Poor Run of Shad.

Statements have been made that the dam is to be blamed for a poor run of shad this year. There is no doubt that the run this year has fallen off, but that the dam is to be blamed for it does not seem to be borne out by the "Report of the Commissioner of Fisheries" for the fiscal year ending June 30, 1913, (copy of which is attached) and wherein certain of the pertinent statements have been underlined by us.

"Shad and Herring Fisheries of Chesapeake Bay."

"Inquiries conducted by the Bureau show that the spring fishing season of 1913 was the poorest in many years in most parts of the Chesapeake Basin, and the aggregate catch of the principal spring fish, shad and herring—much less than in recent years. The effects of the diminished run of fish will

be seen from three to five years hence, when the reduced progent of the 1913 season's supply comes back to spawn.

The conditions in the Potomac River, which may be taken as typical for all the major streams, were in some respects the worst in 40 years. The upper reaches of the river were almost barren of fish during the entire season, and nearly all the shad and herring fishermen failed to meet expenses. At Ferry Landing, Va., the largest seine on the river, 1,200 fathoms long, discontinued operations in the middle of the season owing to the scarcity of fish. In former years this celebrated fishing shore, with a smaller seine, sometimes yielded 200,000 or more herring at a haul and up to 10 or 15 years ago took probably 15,000 to 30,000 fish at a haul on an average. Only a few years back from 1,000 to 1,500 shad were frequently taken at one set of the seine. In 1913 the largest haul was 3,000 herring and 100 shad, while many times only 6 to 20 shad were taken.

The shad hatcheries operated by the Bureau on the Potomac and Susquehanna Rivers had a very unsuccessful season. Their operations afford a good criterion of the condition of the fishery in the fresh waters, because the whole field is covered and nearly every ripe fish that is caught by the fishermen is stripped of its eggs by spawn takers and sent out from the hatcheries.

Shad culture on a scale that is entirely feasible can, with minor protective legislation, maintain the shad fishery in almost any stream, but shad culture under existing conditions is deprived of one very essential requirement, namely, an adequate supply of ripe eggs for hatching purposes.

The immediate cause of the failure of the shad and herring fisheries in 1913 is the diminished run of spawning fish into Chesapeake Bay from the sea and the enormous quantity of apparatus among which a limited catch had to be divided. Inasmuch as the great bulk of the yield is taken in salt water, the remnant that was able to reach the spawning grounds in the streams was insignificant and wholly inadequate to maintain the supply.

The remove cause of the present condition in excessive fishing in former years and the lack of even the minimum amount of protection that is demanded by regard for the most elementary principles of fishery conservation. Fish entering Chesapeake Bay have to run through such a maze of nets that the wonder is that any are able to reach their spawning grounds and deposit their eggs. The mouth of every important shad and herring stream in the Chesapeake Basin is literally clogged with nets, that are set for the special purpose of intercepting every fish, whereas a proper regard for the future welfare of the fisheries and for the needs of the migrating schools would cause the nets to be set so as to insure the escapes of a certain proportion of the spawning fish.

Adequate protection of the fishes is compatible with great freedom of fishery and with a large and increasing yield. A very slight curtailment of the catch, perhaps as little as 10% in any given year, may be sufficient to perpetuate the species



View looking down stream along the completed fishway in operation during winter flood, 1913.

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Shad culture on a scale that is entirely feasible can, with minor protective legislation, maintain the shad fishery in almost any stream, but shad culture under existing conditions is deprived of one very essential requirement, namely, an adequate supply of ripe eggs for hatching purposes.

The immediate cause of the failure of the shad and herring fisheries in 1913 is the diminished run of spawning fish into Chesapeake Bay from the sea and the enormous quantity of apparatus among which a limited catch had to be divided. Inasmuch as the great bulk of the yield is taken in salt water, the remnant that was able to reach the spawning grounds in the streams was insignificant and wholly inadequate to maintain the supply.

The remote cause of the present condition is excessive fishing in former years and the lack of even the minimum amount of protection that is demanded by regard for the most elementary principles of fishery conservation. Fish entering Chesapeake Bay have to run through such a maze of nets that the wonder is that any are able to reach their spawning grounds and deposit their eggs. The mouth of every important shad and herring stream in the Chesapeake Basin is literally clogged with nets, that are set for the special purpose of intercepting every fish, whereas a proper regard for the future welfare of the fisheries and for the needs of the migrating schools would cause the nets to be set so as to insure the escapes of a certain proportion of the spawning fish.

Adequate protection of the fishes is compatible with great freedom of fishery and with a large and increasing yield. A very slight curtailment of the catch, perhaps as little as 10% in any given year, may be sufficient to perpetuate the species



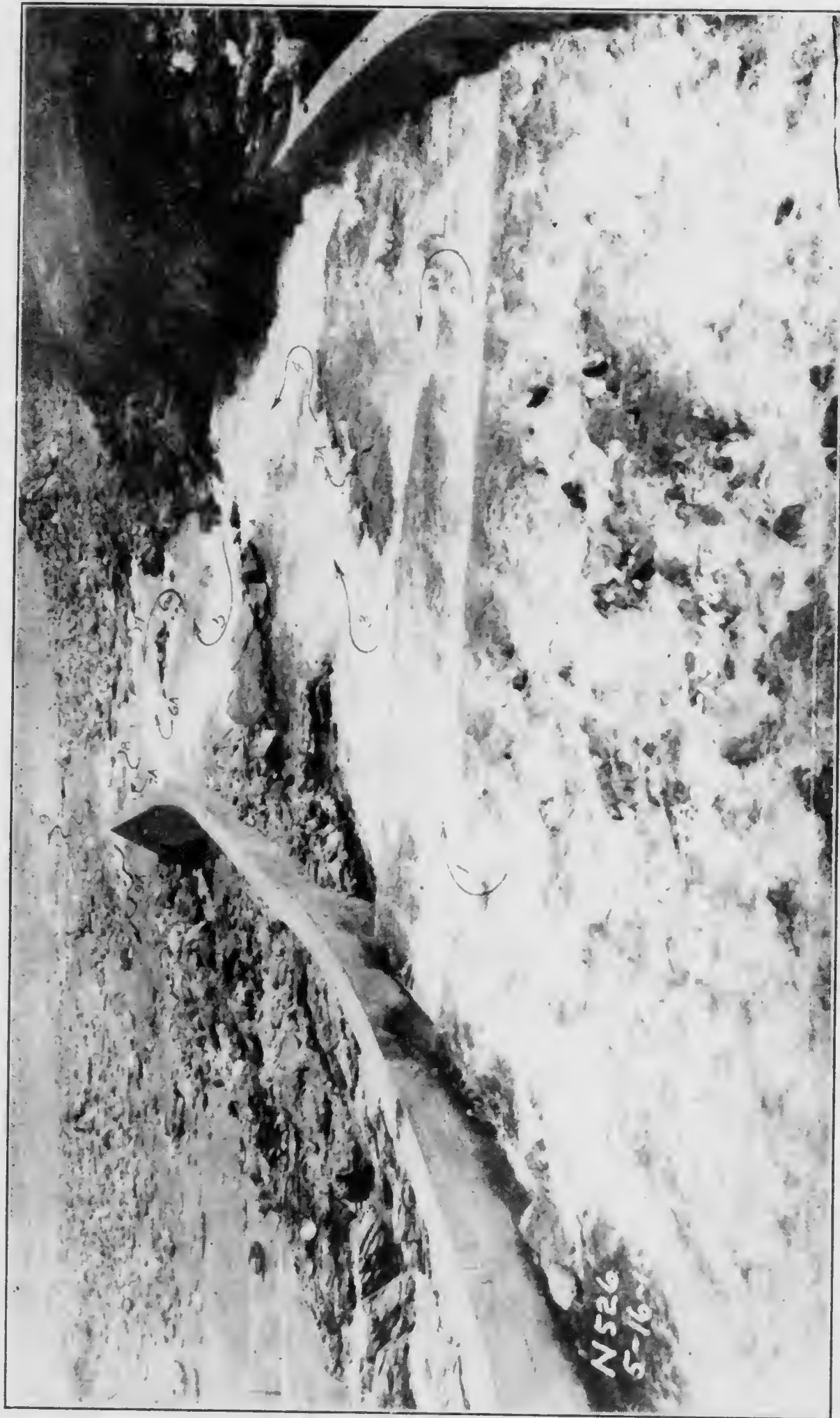
View looking down stream along the completed fishway in operation during winter flood, 1913.



Down stream view of fishway showing improved conditions at 18" over-flow. Arrows with number indicate the direction of the water flow at medium river stages during the fishing season. Arrows marked with the same number, for instance: 3 and 3-A, indicate that a portion of the water is divested over a side path. The water flow resembles for the most part of its zig-zag course the conditions in a trout stream, covering a length of over 1,000 ft. The cross channels and reefs had to be produced partly from natural rock and partly with artificial barriers, by taking greatest care in utilizing existing sound rock and in not creating obstructions that would be destroyed by successive ice floods and high water. During high water stages the huge water masses do not follow any more the zig-zag course, but rush down with the tremendous force as a straight line torrent.



Showing the sheer drop at the end of the original York County fishway, produced by erosion by the heavy ice floods of the spring of 1914.



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Showing the steep drop at the end of the original York County fishway, produced by erosion by the heavy ice floods of the spring of 1911.



Fishway protection destroyed by ice floods of January, 1915. This shows the immense stress to which any mechanical protection or regulating device is exposed, at the head of the fishway.

and result in increased production in a few years. To disregard a requirement so small and to permit the continuance of an evil so serious simply invites and encourages the destruction of a most valuable food supply.

These conditions demand the immediate attention of the States and the application of a radical remedy. Their failure or inability to meet the situation by individual and cooperative action would seem to call for interference on the part of the Federal Government, a course which is being strongly urged by many thoughtful persons in the case of fishes which are migratory and can not be regarded as the property of any particular State."

There is also attached a statement from the Bureau of Fisheries referred to, indicating the extent of the shad fisheries over the middle Atlantic States for a number of years—1880 to 1909, given for those States having shad rivers. From this it appears that the shad catch has been falling off since the year 1901 up to 1909. In this connection it is to be borne in mind that the Holtwood dam was not closed in until the latter part of 1910 and that shad did go past the dam in 1909.

An investigation indicates that upon other shad rivers there was complaint this year of the small shad run and naturally upon these rivers there was no opportunity to complain of the Holtwood dam.

FURTHER WORK ON THE FISHWAY.

In the design of the new fishway, the credit for the general features of which is due to Mr. Buller, the Power Company also assisted to what extent it could, going so far as to have a representative make a personal investigation of the most important fishways in Europe. It is believed that the new fishway is superior to any other type which has so far been developed; considerably superior, in fact, to the old type fishways at Holtwood, which latter type is still a standard in use in the United States. Various improvements have been made from year to year on the new fishway as they suggested themselves to Mr. Buller.

Hostile criticism has been directed at the present fishway at times by certain persons who have designed or invented types of fishways, some of which types though novel to this country have been tried out on the continent and discarded, as is reported by the Power Company's investigator. Naturally, the Power Company has not wished to take the position of advocating any particular type of fishway, and probably this attitude of the Company has produced some exasperation in the minds of certain of the inventors.

The building of an effective fishway under the unusual conditions obtaining at Holtwood has naturally been a rather difficult proposition, and the considerable investigation work, time, designing, and money spent in developing the fishway and improving it, by those responsible for the development of the fishway, has resulted sometimes in a feeling of discouragement by them when in the midst of all this endeavor they have been subjected to unjust criticism.



Fishway protection destroyed by ice floods of January, 1915. This shows the immense stress to which any mechanical protection of regulating device is exposed, at the head of the fishway.

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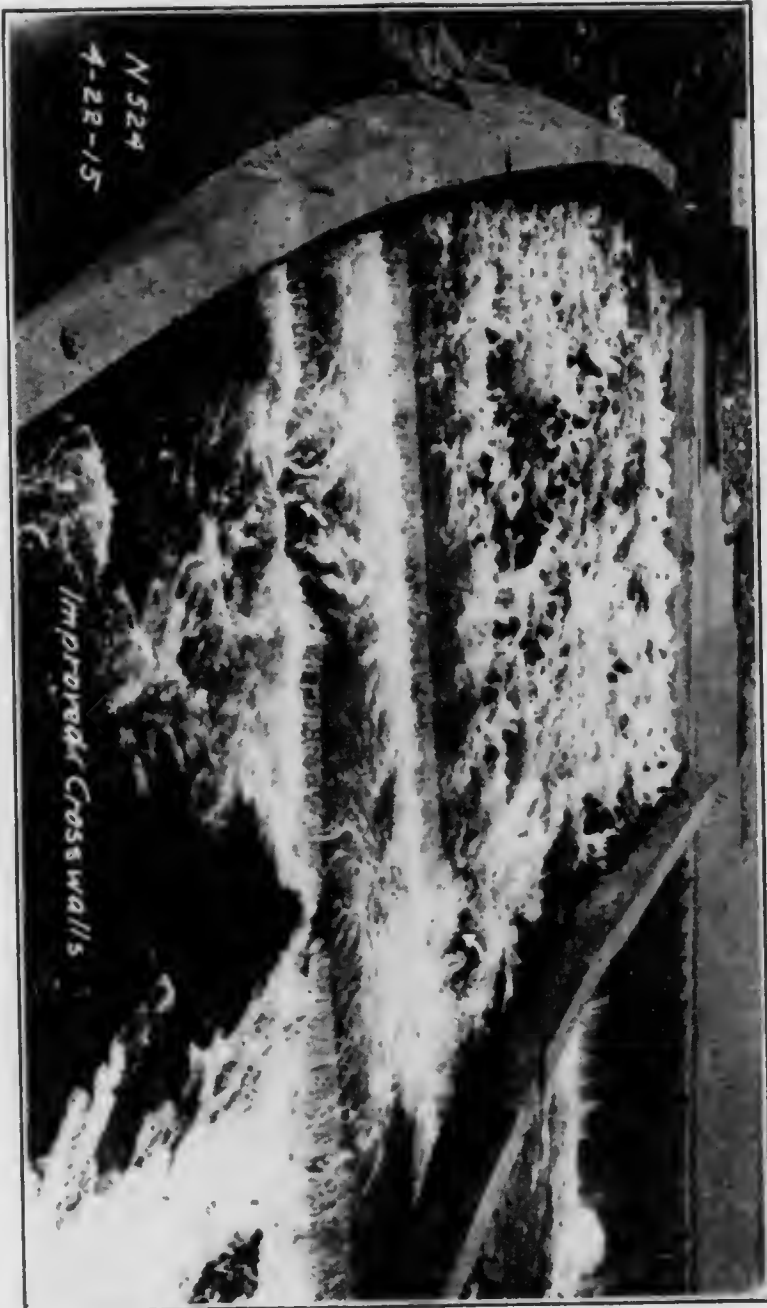
REPORT OF THE

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Shad Fisheries of the Middle Atlantic States for a Series of Years.

	New York.		New Jersey.		Pennsylvania.		Delaware.	
	Lbs.	\$	Lbs.	\$	Lbs.	\$	Lbs.	\$
1880.	2,733,600	\$135,680	864,000	\$40,700	558,600	\$27,980	1,050,000	\$52,500
1887.	627,100	24,051	6,494,957	308,147	1,423,952	76,175	1,270,492	47,629
1888.	599,425	24,795	6,523,447	307,543	1,387,200	76,942	1,389,216	51,599
1889.	4,332,532	217,988	10,423,572	379,543	2,572,572	125,717	1,498,653	64,903
1890.	3,776,975	190,180	10,622,719	409,659	2,898,551	131,226	1,797,218	66,812
1891.	3,044,956	161,209	10,225,455	443,488	1,632,864	123,274	1,500,196	64,699
1892.	No canvass.	.....	8,746,518	582,221	1,696,432	110,200	1,110,369	60,255
1896.	2,200,546	74,833	13,909,836	340,056	2,507,143	79,446	1,993,294	69,260
1897.	1,884,228	62,953	13,000,783	342,173	2,007,328	63,587	1,620,364	47,562
1898.	1,829,777	62,745	12,844,432	293,173	No canvass.	.....	No canvass.	.....
1901.	3,432,472	110,682	14,031,002	475,202	2,982,868	124,328	1,367,852	56,605
1904.	498,119	36,826	4,337,907	238,517	835,544	32,472	951,020	67,928
1908.	360,000	27,000	3,004,000	229,000	593,000	28,600	870,000	63,000
1909.	No canvass.	.....	No canvass.	.....	210,157	22,224	25,950	2,310

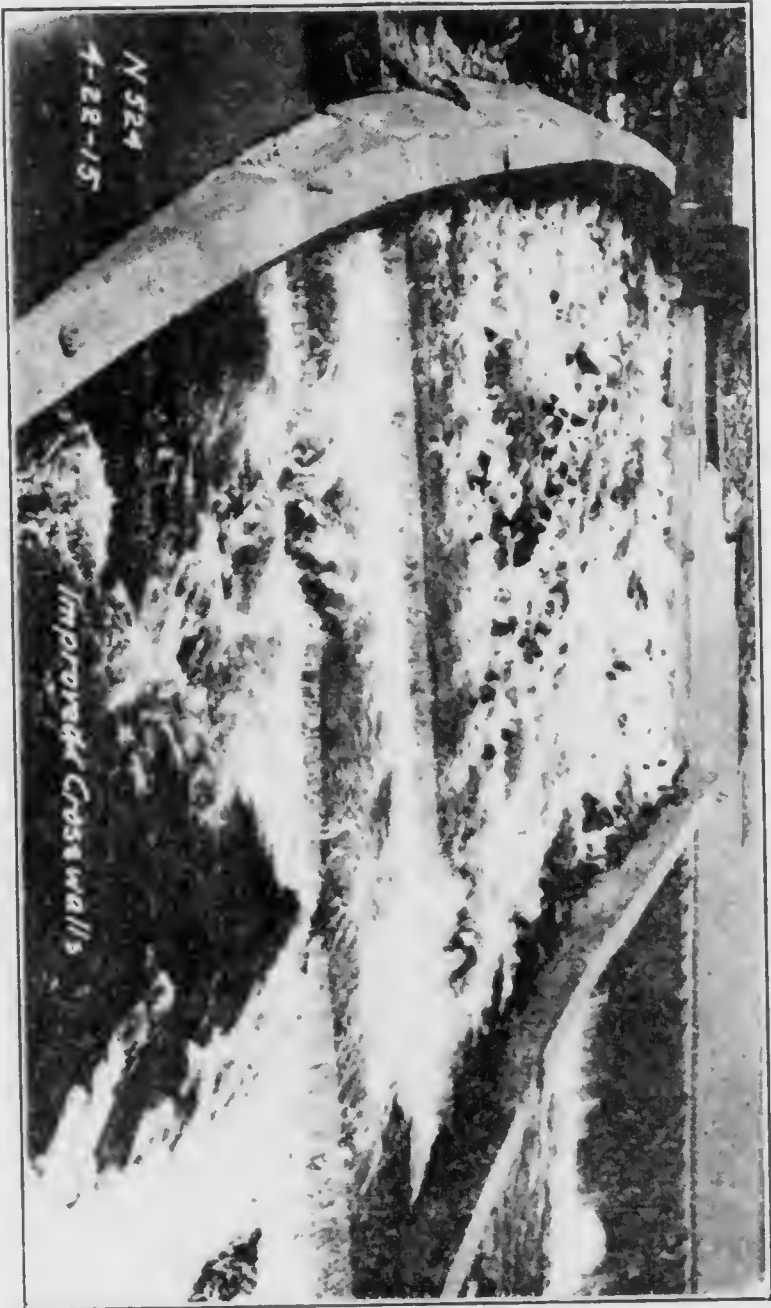
Improved zig-zag flow secured over both baffle walls Nos. 1 and 2, after openings were blasted in concrete walls, as indicated by white arrows.



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1903.	360,000	27,000	3,004,000	229,000	533,000	38,600	870,000	68,000
	No canvass.		No canvass.		210,157	22,223	25,950	2,310

Improved zig-zag flow screen over both battle walls Nos. 1 and 2, after openings were blasted in concrete walls, as indicated by white arrows.



STATEMENT OF JAMES ARMSTRONG REGARDING SHAD
SEEN IN FOREBAY, AUGUST 24, 1915.

To Whom It May Concern:—

This is to certify that I, the undersigned, saw the carcass of a shad floating in the Forebay of the Pennsylvania Water and Power Company's Generating Station, at Holtwood, Pa., on Tuesday afternoon, August 24th, 1915, between the hours of four and five past meridian.

I was at that time, on my way into the Power House of said Station, and while walking along the passageway over the Wing Wall, my attention was called to the presence of the dead fish, by Mr. T. C. Stabley, of Holtwood, Pa., with whom I was walking. We stopped, examined the fish as well as we could from our position, about thirty feet away, and together with Mr. Alexander E. Bauhan, of Holtwood, Pa., who came along shortly afterward, we discussed the characteristics which proved beyond dispute to us, that the fish must have been a SHAD, and we suggested how it might have gotten to the place where we saw it.

I have lived my entire life in regions where shad have been caught in great numbers (at Columbia and Holtwood, Pa.), and furthermore I have had experience with fish and with fishing since childhood, and this experience, I think, qualifies my ability to determine whether or not the fish in question was a shad.

Apparently the fish died a natural death, as there was not visible to us any evidence of violence of external injury.

(Signed) JAMES ARMSTRONG.

Affirmed and subscribed to before me, this sixth day of October, nineteen hundred and fifteen.

(Signed) C. H. ARMSTRONG.

(Seal.)

My commission expires December 31, 1915.

STATEMENT OF T. C. STABLEY, REGARDING SHAD SEEN
IN FOREBAY AUGUST 24, 1915.

To Whom It May Concern:—

On August 24, 1915, at about 4:15 past meridian, I, Tilman C. Stabley, observed from the Forebay Wing Wall, of the Pennsylvania Water & Power Company, at Holtwood, Pa., a dead shad floating among some light drifts on top of the water in the Forebay, approxi-



Middle portion of fishway with 10 ft. of water passing over the dam, but free from ice. The force of these water masses, if they could be turned into useful power, could produce 20,000 H. P., but here it acts like so much energy destroying all barriers and obstructing walls in its way.

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mately twenty feet distant. I watched same closely for about five minutes. I returned to the Power House in company with Dr. James Armstrong, who agreed with me that the fish was, without a doubt a shad common to the Susquehanna River; which abound in great numbers at this place every spring.

The dead shad I observed to be approximately five to six inches wide and approximately twenty-two inches long. I reported my observations to Messrs. H. W. Lowy and Alex. E. Bauhan.

As I have been a resident of Holtwood, Pa., for the past five years, and having been in close contact with local shad and game fishing, I believe that I am sufficiently familiar with the fish that are common to this section of the Susquehanna River, to determine their specie, especially the shad.

(Signed) T. C. STABLEY.

Affirmed and subscribed to before me this sixth day of October, nineteen hundred and fifteen.

(Signed) C. H. ARMSTRONG.

(Seal.)

My commission expires December 31, 1915.

STATEMENT OF ALEXANDER E. BAUHAN REGARDING SHAD SEEN IN FOREBAY AUGUST 24, 1915.

To Whom it May Concern:

On August 24, 1915, as I, Alexander E. Bauhan, was leaving the power house of the Pennsylvania Water & Power Company at Holtwood, Pa., between the hours of four and five past meridian, I met Mr. T. C. Stabley and Dr. James Armstrong, on the Entrance Wing Wall, at a point just above the old fishway gates.

Mr. Stabley called my attention to a shad, which was floating on its side, among some driftwood in the water, in the Forebay, at a point just outside of the curved part of the Gate House foundation wall. We stood and looked at it for a few minutes, when we thought Mr. H. W. Lowry should be informed of the fish, in order that he might take a photograph of it. Dr Armstrong and Mr. Stabley continued on their way into the power house, and I continued on my way out.

(Signed) ALEX. E. BAUHAN.

Affirmed and subscribed before me. Oct. 5th, 1915.

C. G. ENGLE,

(Seal.)

Notary Public.

My commission expires January 21, 1915.

FAIRMOUNT PARK AQUARIUM.

As in former years the Department of Fisheries has co-operated with the Fairmount Park Aquarium, which is located in Philadelphia, in keeping up the supply of fish, and it believes that this co-operation has done much to attract the visitors at the Aquarium in Fairmount Park.

The Superintendent of the Park reports the following fish caught by the employees of the Aquarium during the year 1915:

Rock Bass,	1
Yellow Perch,	19
Common Sunfish,	70
Yellow Catfish,	1
Large Mouth Bass,	1
	<hr/>
	92

In addition a number of suckers and carp were caught.

WAYNE HATCHERY.

During the year further work towards the completion of the Wayne hatchery was carried on. The work under the direction of the superintendent of the hatchery was done with dispatch when taking into consideration the small number of men and teams he had to work with, besides the care and propagation of the fish at the hatchery and the operation of the field work.

It is the intention of the Department to make this hatchery one of the most complete and up to date stations possible. It is a stupendous task, however, and will cost at least a hundred thousand dollars before completed. The Department feels that taking into consideration the location of this hatchery and the great field of work that can be carried on there, that it is money well spent. It is also intended to use this hatchery to train fish culturists, and it will endeavor to make it a comfortable home and have the hatchery buildings modern and up to date for the employees.

The greatest need of all at the hatcheries today is a larger force of trained men who will be available at any time to respond to a call. The splendid facilities of the Department for supplying fish when its hatcheries are all completed will be wasted to a great extent if it does not have the force of men to use these facilities to the limit. These trained men are to be a permanent corps, always ready to respond when called upon.

The contracts at this plant which were let to the Hagen Lumber Company have all been completed, conforming in every respect to the plans and specifications called for and present an attractive appearance.

The Department has been very much hampered in its work at this station because of the slow work of the firm having the contract for the erection of the new hatchery and for the erection of the aqueduct and series of trout ponds. The hatchery, under the contract, was to be completed by the first day of November, and at this writing is still in an incomplete stage and the Department will have to resort to drastic action unless this work is completed when the weather permits with the greatest possible dispatch, having all men available and machinery working on the building. The same action will have to be taken in regard to the aqueduct and series of trout ponds.

The firm holding this contract is the Forest City Lumber and Construction Company, and the Department has about exhausted its patience with them; in fact in all its contracting work which has been carried on at all the hatcheries, this is the only contract the Department has let to any firm that it has had any trouble with at all.

CORRY HATCHERY.

The plant at Corry is practically completed and is one of the finest plants to be found in the United States for the propagation of trout. It is the intention, however, to enlarge this plant so that it will be possible to raise bass together with the trout. The water, after it has passed through the trout ponds, and warmed up to the proper temperature, will be used for the rearing of the bass.

One of the first requisites of a successful hatchery is an ample water supply which should be wholly under the control of the hatchery, and this requisite is entirely met at the Corry hatchery. The lay of the ground is such that it is possible to have ample pondage and keep the water completely aerated, there being a 14 foot fall that is available. This water has a temperature of 46 degrees F., and with this temperature and the availability of aeration, it is possible to carry an unusual number of fish.

The new ponds are arranged in a series, each series having a flume to convey the water from one section to another with good aeration and each pond has its own entrance and outlet so that it can be drained and cleaned without interfering with any of the others. They vary in size, the depth running from two feet to six feet, and in length from 20 to 90 feet, with a breadth of 16 feet to 24 feet.

The walls are all built of re-enforced concrete running from 10 to 14 inches in thickness, and the bottoms also are of concrete. The walls are all topped with a six inch coping which projects two inches



Corry Brook Trout Hatchery. Eastern entrance to Hatchery building.

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Corry Brook Trout Hatchery. Eastern entrance to Hatchery building.





Interior view of Corry Hatchery, showing hatching troughs.

and gives a nicer appearance, so that while the ponds are of the best for fish culture, they are also good to look upon with an artistic eye. The flumes are 21 inches wide allowing ample flow of water, and where necessary are four feet wide. There are several reservoirs for sedimentation of the water before it enters the hatchery which are built the same as the ponds. With these ponds all concrete it is utterly impossible for the banks to be invaded by muskrats or crayfish, those enemies of ponds burying in the banks and leaving the water out of the ponds at unexpected times causing a loss of thousands of fish. These ponds should hold a million and a quarter of fish until they are a year old. There is still room on the grounds for 20 more ponds, which it is proposed to build, and then there is room for bass ponds, the water by the time it reaches the last ponds being warm enough for bass work. With this series of ponds an additional hatching house is proposed which can be used for the brown trout work.

With the warming up of the streams in Pennsylvania, the propagation of brown trout has become a very important matter, because the brown trout will live and thrive in water that is too warm for the brook trout. The brown trout is the trout whose praises are sung by old Izaak Walton, and it grows to a larger size than the brook trout, and to the devotee of old Izaak its taking affords much sport and excitement.

The new hatching house has been completed and it is not too much to say that it has no superior in detail and completeness in the United States. It is built of Corry oriental brick with black mortar, covered with a cement roof with a tile cornice, the architectural effect being good. It is all finished in steel and re-enforced cement so that it is absolutely fireproof, while it is heated with hot water so that the trout work can be done in the winter time by the employes with a comfort not possible in the old unheated houses. There are 19 double troughs 18 feet long set on steel trestles. The supply trough is 10 inches deep and 12 inches wide.

There are 11 ornamental aquariums arranged along one of the walls which will be used for exhibition purposes of the various fish and is an object lesson for the visitors who are much interested in the occupants. In one end of the house is the office of the superintendent. There are two entrances, one to take up the cans and the other leading to the office. A steel stairway leads to the second story which has a concrete floor and will be used for the storage of the cans and other property. Everything is the most complete character and up to the latest thing in fish culture.

A bronze plate bearing the coat of arms of the Commonwealth of Pennsylvania carries the name of the Department, the names of the Commissioner of Fisheries, the Board of Fishery Commission, and the Superintendent of the hatchery. There is a concrete pavement in front of the building for convenience in loading and unloading the cans. In fact it has been the effort to provide for every detail that is needed to make the building the most complete of its kind.

The ornate character of the building and its generally artistic beauty attracts much favorable comment from visitors who commend it as in keeping with the dignity of such a great Commonwealth as Pennsylvania. The only trouble is that it had to be



Interior view of Cory Hatchery, showing hatching troughs.

and gives a nicer appearance, so that while the ponds are of the best for fish culture, they are also good to look upon with an artistic eye. The flumes are 21 inches wide allowing ample flow of water, and where necessary are four feet wide. There are several reservoirs for sedimentation of the water before it enters the hatchery which are built the same as the ponds. With these ponds all concrete it is utterly impossible for the banks to be invaded by muskrats or crayfish, those enemies of ponds burying in the banks and leaving the water out of the ponds at unexpected times causing a loss of thousands of fish. These ponds should hold a million and a quarter of fish until they are a year old. There is still room on the grounds for 20 more ponds, which it is proposed to build, and then there is room for bass ponds, the water by the time it reaches the last ponds being warm enough for bass work. With this series of ponds an additional hatching house is proposed which can be used for the brown trout work.

With the warming up of the streams in Pennsylvania, the propagation of brown trout has become a very important matter, because the brown trout will live and thrive in water that is too warm for the brook trout. The brown trout is the trout whose praises are sung by old Izaak Walton, and it grows to a larger size than the brook trout, and to the devotee of old Izaak its taking affords much sport and excitement.

The new hatching house has been completed and it is not too much to say that it has no superior in detail and completeness in the United States. It is built of Corry oriental brick with black mortar, covered with a cement roof with a tile cornice, the architectural effect being good. It is all finished in steel and re-enforced cement so that it is absolutely fireproof, while it is heated with hot water so that the trout work can be done in the winter time by the employes with a comfort not possible in the old unheated houses. There are 19 double troughs 18 feet long set on steel trestles. The supply trough is 10 inches deep and 12 inches wide.

There are 11 ornamental aquariums arranged along one of the walls which will be used for exhibition purposes of the various fish and is an object lesson for the visitors who are much interested in the occupants. In one end of the house is the office of the superintendent. There are two entrances, one to take up the cans and the other leading to the office. A steel stairway leads to the second story which has a concrete floor and will be used for the storage of the cans and other property. Everything is the most complete character and up to the latest thing in fish culture.

A bronze plate bearing the coat of arms of the Commonwealth of Pennsylvania carries the name of the Department, the names of the Commissioner of Fisheries, the Board of Fishery Commission, and the Superintendent of the hatchery. There is a concrete pavement in front of the building for convenience in loading and unloading the cans. In fact it has been the effort to provide for every detail that is needed to make the building the most complete of its kind.

The ornate character of the building and its generally artistic beauty attracts much favorable comment from visitors who commend it as in keeping with the dignity of such a great Commonwealth as Pennsylvania. The only trouble is that it had to be

erected on low ground on account of the water supply, and therefore it does not show off as well as if it would be on high ground where its beauty would be more in evidence.

Much work has been done in putting the grounds in shape that their natural capabilities deserve. The grounds were thoroughly ditched and then drain tile was placed, after which the grounds were graded and sown with grass. Walks and drives are built and graveled ornamental steps are built in the terraces. A fountain was erected near the hatching house with an ornate basin of rock work in which gold fish disport themselves like glimmers of golden sunlight and the plashing of the fountain mingles its music with the murmur of the water then falls from one pond to another.

The old office building has been fitted up as a retiring room for ladies, a convenience much appreciated by the numerous visitors and which will be supplemented with a similar place for the men. A number of retaining walls have been built where the grade rendered them necessary. All the buildings have been repainted and all the concrete work is painted with a special preparation to make it non-absorbent of water and thus keep it from being affected by the frost. This paint also adds to the appearance of the concrete making it look like marble. A lagoon was built along the east side of the drive in which will be kept the mature fish that will be used in the aquariums, and mature fish have a greater attraction for visitors than the small ones.

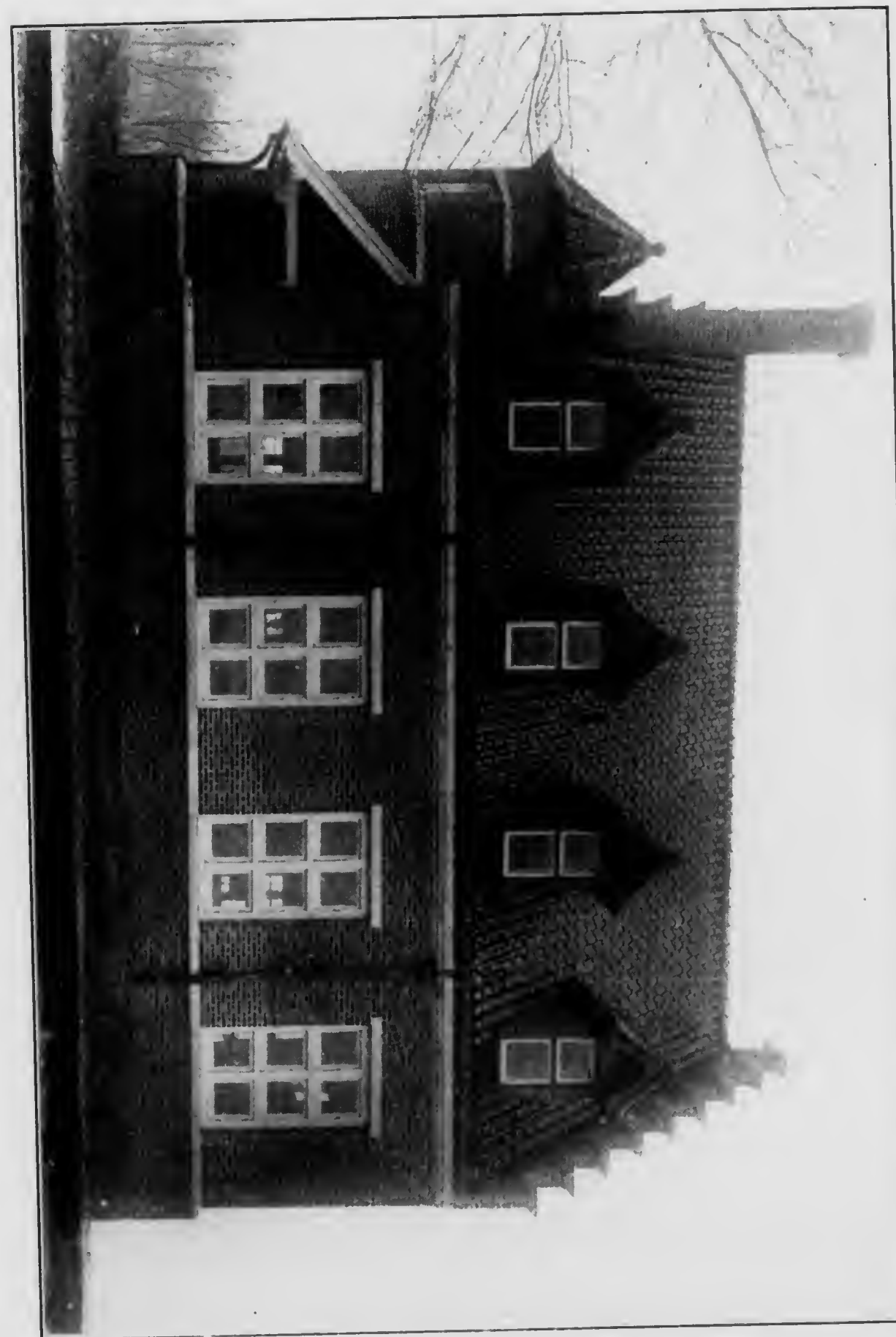
The question of a fence along the front of the grounds has been a problem, owing to fences previously used being so unsatisfactory. It was finally decided to erect a fence of concrete posts connected by a chain which gives a fence of a highly artistic character and in thorough consonance with the grounds.

BELLEFONTE HATCHERY.

At the Bellefonte Hatchery there was erected a hatching house, constructed of concrete, brick and steel, as the old hatching house was unsafe to work in. A few concrete ponds were built but outside of this work no new work was done. It will be necessary to wait until the next Legislature appropriates more money before this hatchery can be completed.

TORRESDALE HATCHERY.

Very little new work was done at this plant owing to the lack of funds. The city, however, has made many improvements and has reclaimed about four acres of ground, which is included in the land



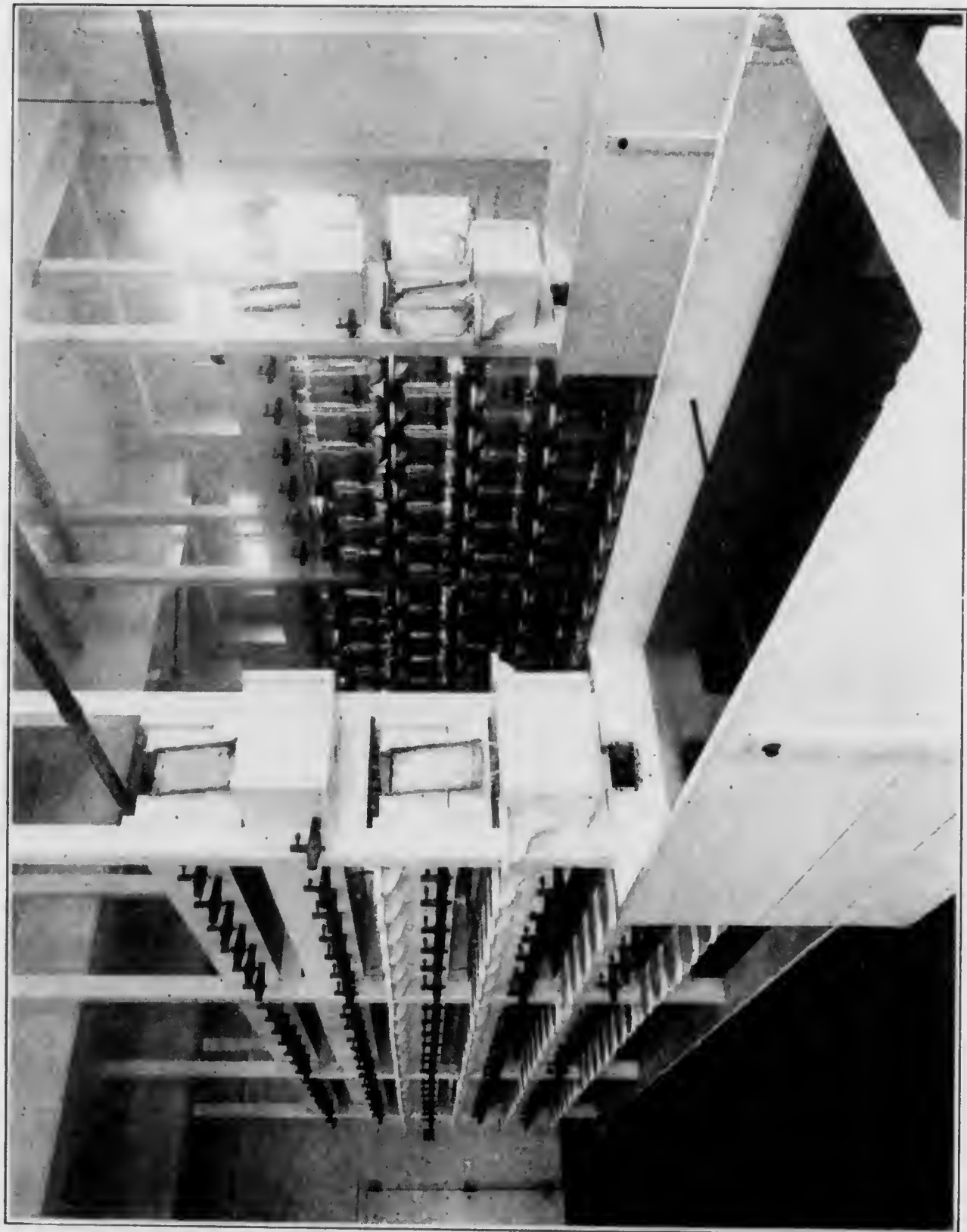
Torresdale Fish Hatchery.



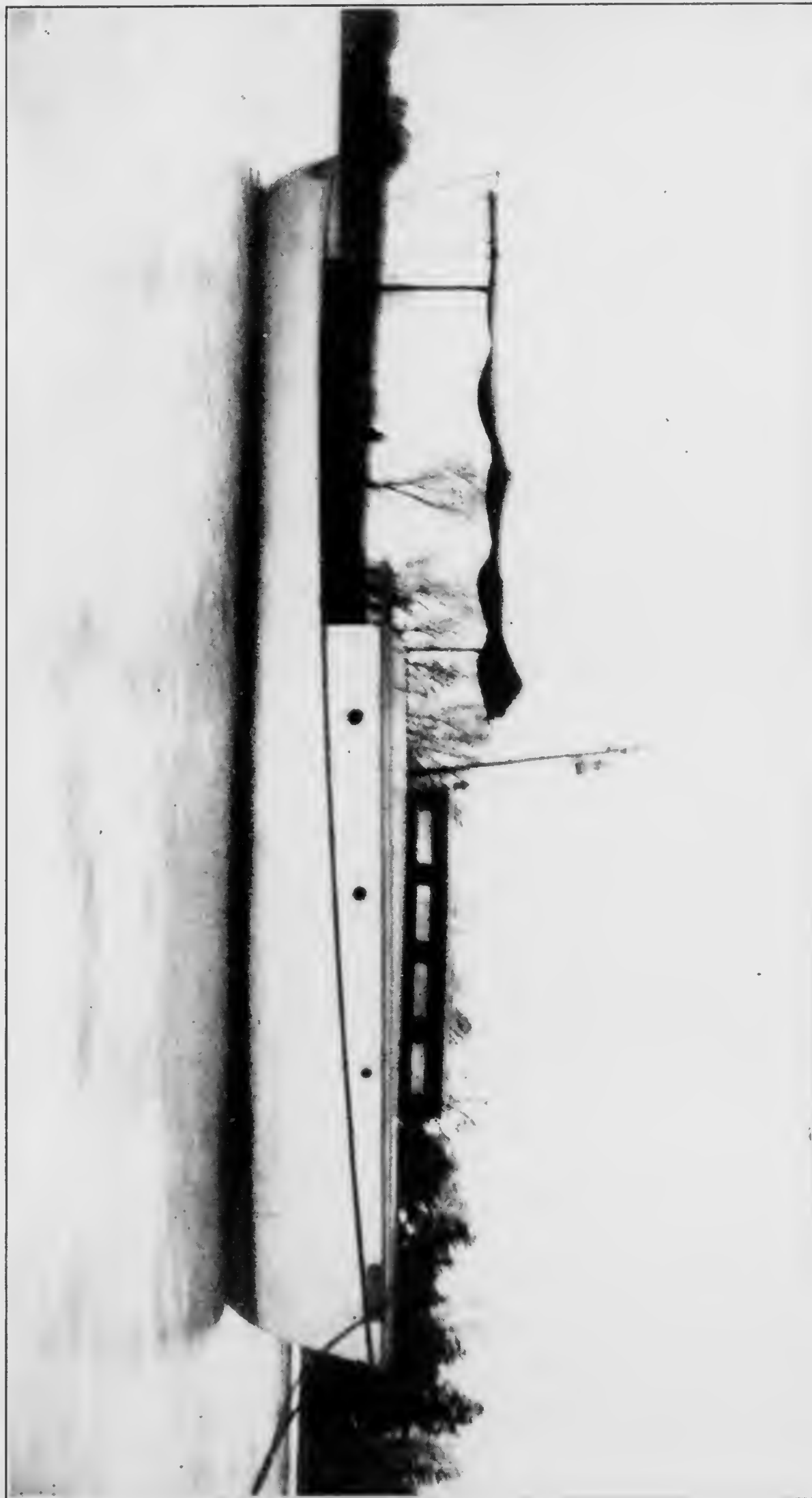
Department's Yacht "Anna" on Delaware River.



Interior Torresdale Hatchery, showing batteries and hatching jars.



Interior Torredale Hatchery, showing batteries and hatching jars



Department's Yacht "Anna" on Delaware River

leased by the Department. The new building which was erected two years ago has been of much service in the hatching of shad eggs, and this building enables the men to work both day and night when occasion requires.

The fishermen on the river are so much interested in the artificial propagation of shad that the Department no longer has any trouble in getting them to bring their shad eggs to the hatchery to be propagated. The fishermen all claim that if it were not for the artificial propagation carried on by the Department the catch of shad would be much smaller than it is at the present time.

The report of the superintendent shows that the experiment of the artificial propagation of catfish to be most successful, and has awakened the attention of fish culturists in every section who have visited the plant and looked over the wonderful results obtained. With a little more experience the Department believes that there will be no trouble in meeting all the demands made for these fish.

Much good work was done with the Cruiser Anna on the river in collecting the shad and their eggs, and in planting the shad fry from Trenton to the Delaware State line. It was impossible to go farther north than Trenton with the Cruiser Anna on account of the falls. The shad planted above the falls were sent by messengers on the railroad.

ERIE HATCHERY.

The Department feels that it must congratulate the citizens of the Commonwealth of Pennsylvania in having in the Erie hatchery a plant that has no superior in the United States, the new hatching house having been finished during the year. It is situated on the shores of the lake on the grounds of the water works or filter plant, the ground having been ceded to the Department of Fisheries for the purpose, and no more suitable place could be found for such a hatchery in the United States.

It is at a corner of the dock with water on both sides and when the water lot is dredged, which the Water Commission will do shortly, the Department's boat the Commodore Perry, can come right up to the house and load and unload the fish and eggs, thus saving the drayage bills that were necessary when the old hatchery was occupied at the corner of Second and Sassafras streets, and all the eggs and fish had to be hauled from the water to the hatchery and from the hatchery to the water.

The new house is a two story building of brick and concrete with a tile roof, so that it is absolutely fire proof, and it architecturally conforms with the buildings of the filter plant, thus making an ornamental adjunct to the park. It is built of red brick with Illinois sandstone trimmings, and the interior is all finished with cement plaster. Externally the building is an architectural credit

to the State and an ornament to the water works grounds. It is fronted by a lawn, which when placed in order, will make the plant still more ornamental.

The house is sixty by eighty feet and the equipment is the very latest up-to-date. It is lighted with electricity and heated by steam so that night work can be as well done as day work, while with the heat, winter will have no terrors for the fish culturist as it had in the old unheated hatchery.

As the visitor enters the building he is struck with the apparent size of the interior, with its glistening white walls. The batteries are to the right and are supplied with raw water from the lake, the eggs of the fish not having vitality enough to hatch in the treated water, which was the cause of the necessity of the removal of the hatchery to its present position where it is possible to get the untreated water. There are thirteen fry tanks which give most ample room for the handling of the fry and this is in strong contrast with the cramped accommodations of the old house. A large gallery surrounds the interior and makes a roomy second story, while the opening in the center allows the skylight in the roof to add to the lightness of the lower floor, while it also adds to its impressiveness.

All the pumping and water fixtures are of the best and latest design and everything is under perfect control. All the plumbing is carried in open conduits so that if it is required to get at any of the plumbing it is only necessary to remove the iron covering over the conduit without disturbing the floor.

As the walls and floors are all of concrete and all painted with a water proof preparation, it is possible to keep everything in an immaculate condition, and this possibility excites envy in the mind of the women visitors when they mentally compare it with their kitchens. Indeed when one goes over all the merits of this new hatchery the Department feels as it said above, that it can heartily congratulate the people of this great Commonwealth on having the most complete fish hatchery of its kind in the United States, and it would be no exaggeration to say in the world.

While Pennsylvania has only forty miles of shore line on Lake Erie the fishermen of Erie have millions of dollars invested in the fish business. They set hundreds of miles of twine, which is the technical term for nets, a day, and have made Erie the largest fresh water fish market in the world. This constant fishing would long since have depleted the lake and fishing would have been a lost art, as is shown in the case of the white fish, which fifteen or more years ago had become so fished out that fishing for them was no longer profitable.

Then the United States Government, the Fish Commission of Pennsylvania, and the State of Ohio, took up the matter of artificial propagation, and by persistent hatching and planting have restored this white fish industry until it grows better every day, so that now all the fishermen of Erie fully appreciate the advantage of artificial propagation and know that their industry depends upon co-operation with the Department, and this co-operation they now cheerfully extend.

Another thing that should be borne in mind is that the eggs obtained from Lake Erie are all taken from commercial fish, which



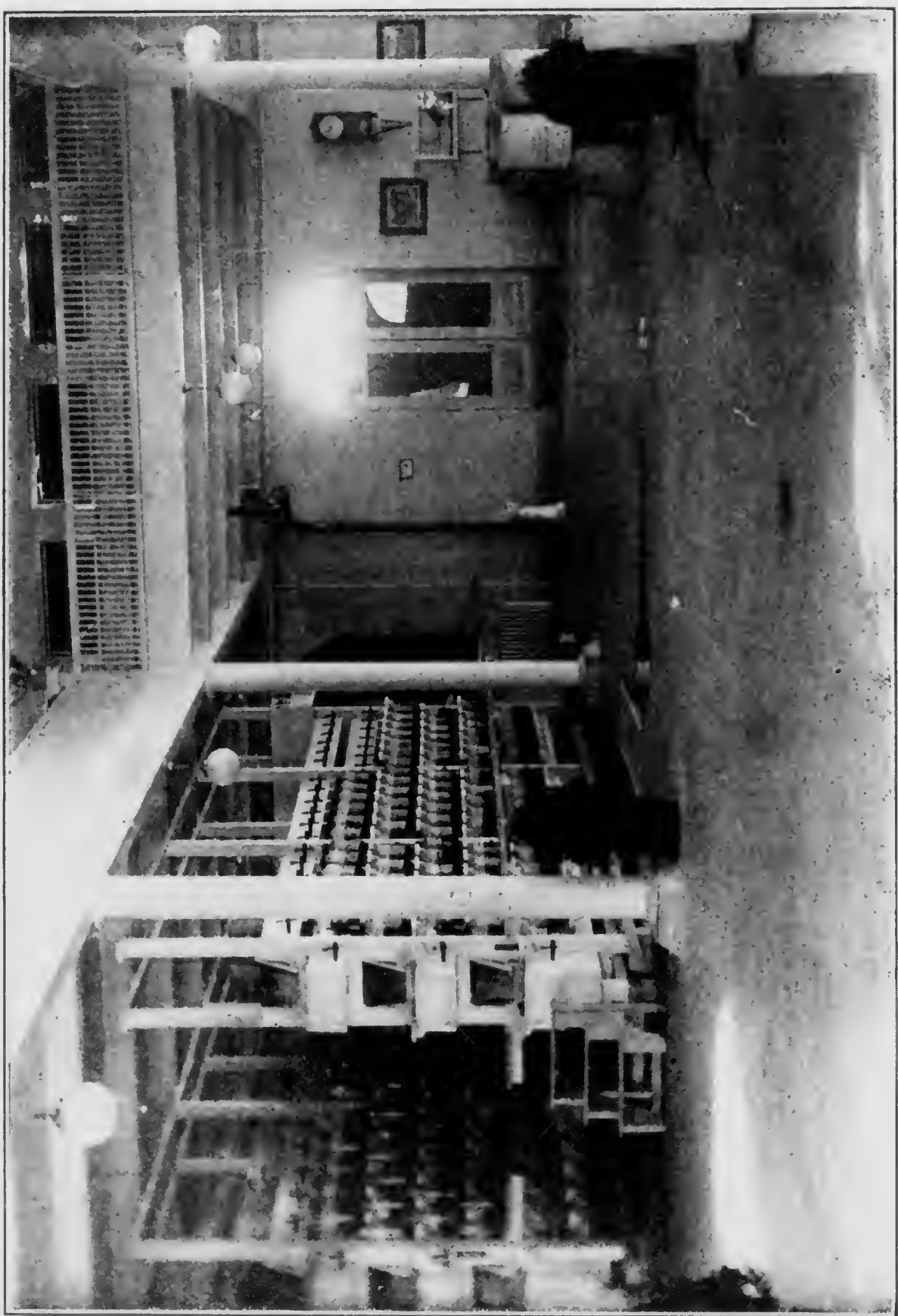
Erie Hatchery.



Interior of Erie Hatchery, showing batteries.



Showing Aquariums on second floor of Erie hatchery.



Interior of Erie Hatchery, showing batteries.



Showing Aquariums on second floor of Erie hatchery.

eggs would be waste product, if they were not taken to the hatchery to be hatched out.

The new hatchery is already a place of much interest to visitors and will be more so as it becomes more generally known. Live fish in captivity have a wonderful attraction for most people, and it is proposed to gratify such people by installing a number of aquariums in which the various species of fish will disport themselves for the pleasure of the dwellers on land.

During the hatching season it will be possible to study the process of incubation from the egg stage until the little fish emerge ready to face life in the waters of the lake. It will be possible to handle with the present facilities, of the largest size eggs, those of the white fish seventy-two millions, and of the smallest, those of the blue pike, four hundred and thirty millions. In addition to these two varieties there are hatched at Lake Erie Station, lake herring, wall eyed pike, better known on the lake shore as yellow pike, and on the Susquehanna River as salmon, and that well known fish, the yellow perch.

In fact the capacity of the hatchery is only limited to the eggs it is possible to obtain, and even if it is overtaxed the surplus can be taken by the Erie Auxiliary, the Torresdale hatchery or the Wayne hatchery. Fortunately, all the eggs do not come in at the same time; the white fish and the herring come in in November and December, the wall eyed pike in April, and the blue pike and yellow perch in May. It will thus be seen that they get out of each other's way.

Everything from this hatchery is planted as soon as it is hatched. In fact it would be impossible to hold them, so rapidly do they emerge from the eggs after they have once started. There are times when they come out by the millions in twenty-four hours. It would be impossible to supply the food for such a myriad of fish, even if we knew what the food is, and besides nature turns the fish loose at this stage when they are hatched naturally.

One of the advantages of artificial propagation is the much larger percentage of eggs which are hatched than when the eggs are laid naturally by the fish and left to shift for themselves, so to speak. In the batteries they are not at the mercy of numerous enemies nor the chance of being covered by mud swept over them by storms. Hence there are more fish to go to make up the future supply.

ERIE AUXILIARY HATCHERY.

No improvements were made at this hatchery as the Department does not have control of the water supply, and until this is remedied no permanent work will be done. It is hoped that the people of Union City and borough officials will realize the importance of having a hatchery located here and will endeavor to assist the Department in its work. The experience at this hatchery shows the great benefit derived from the proper preparation of the eggs before being sent to the hatcheries.

COMMODORE PERRY.

During the past year it was necessary to make many repairs to the steam tug Commodore Perry, which is used on Lake Erie in the collection and planting of eggs and young fish. This boat has been in service for a number of years and at the present time is hampered by the strict regulations of the United States Bureau of Navigation, and she is required to carry a top hamper, which materially interferes with her sea-worthiness. It is absolutely necessary that a new boat be purchased by the Department for the collection and distribution of the eggs and fish in Lake Erie.

ARTIFICIAL PROPAGATION.

The fact that fishes which are artificially propagated are still in abundance and on the increase shows that artificial propagation must be depended on in the future to keep up the supply of fish. This advance is especially shown with the commercial fishes; white fish, herring, blue pike, and wall eyed pike. Fish that are not artificially propagated are on the decrease. This is noticeable even down to the lowly estimated sucker, which has to run the gauntlet of the dip net, the fyke net, the outline and the gig. No spawn is taken artificially; the fish are killed; nothing is put back, as in the case of the commercial fishes, and the result can only be extermination, unless the wasteful methods of taking are prevented and artificial propagation aids nature.

What is true of the sucker is true of many other varieties, and every trout fisherman knows that but for artificial propagation and restocking of the streams, the trout would be one of the extinct fishes in Pennsylvania. This fact is being impressed upon the popular mind, and people are beginning to understand the value of artificial propagation in keeping up the supply of fish.

PERMITS.

Under the provisions of the Act of May 1, 1909, P. L. 353, the Department is authorized to issue permits for the purpose of taking fish for scientific purposes, use of explosives, transferring of fish to



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Commodore Perry.

other suitable waters, etc. During the year the Department issued seventy-three (73) permits including six (6) which were issued to the superintendents of the various hatcheries authorizing them or their employes to take fish at any time of the year for the use of the Department. Permits issued for the use of explosives were generally for the blasting of rocks to make a channel in the rivers, or for the purpose of raising the body of a drowned person. The issuing of permits authorizing the transferring of fish to other suitable waters is the means of saving a large number of fish which would otherwise be allowed to remain high and dry if it were not for the interest taken by the sportsmen in getting them back to their natural habitat. Much of this work was done by the Department's own men.

The following table shows what the various permits were issued for:

Transferring fish to suitable waters,	10
To use explosives,	13
To take fish of specimens of aquatic life for scientific purposes,	12
To close fishway on account of low water,	4
To remove carp,	5
To screen an artificial pond to make repairs,	1
To take fish for spawning purposes,	22
Total,	67

TIDE WATER SEINE LICENSES.

Under the provisions of the Act of June 3d, 1911, P. L. 655, the Department issued three (3) licenses to persons in Philadelphia and Delaware Counties, authorizing said persons to use a haul seine in the tide-water streams wholly within this Commonwealth, and within limits of tide-water of said streams, for the purpose of taking carp, suckers, mullets and catfish.

TRAINING SCHOOL FOR FISH CULTURISTS.

One of the most important needs of the Department of Fisheries is trained fish culturists and the need grows stronger every day that the Department comes nearer the completion of its plans in

rebuilding and rehabilitating the various hatcheries. With its ponds all built in the most permanent manner and with hatching houses equipped with the best devices known to the science of fish culture, the Department is sure that it will be able to respond to all the calls that may be made upon it for fish if it is able to secure a corps of trained men who will be able to use to the highest advantage the facilities at their command.

When the first Fish Commission began its work the science of artificial propagation of fish was as yet in a crude state and experiments were more the work of the culturist rather than the proved methods of to-day. In fact to the general public the artificial propagation of fish was regarded as an experiment from which only failure could be expected. But investigation and experiment by many workers brought about the conditions of to-day when results show that but for the artificial propagation of fish there would be a sad diminution of the fish supply and in many cases extermination. This is really shown in two well known cases. A few years ago the white fish in Lake Erie had become so depleted by the constant fishing that it was no longer profitable to fish for them. Then the United States Government, the Commonwealth of Pennsylvania and the State of Ohio began to propagate the white fish artificially with the result that the supply of these fish is growing greater every year, and the fishermen are once more fishing for them enabling thousands of people to enjoy these truly delicious fish. On the other hand no success has been attained in the artificial propagation of the sturgeon owing to the fact that it has never been possible to obtain the male and female fish at the same time in a ripe stage. The result has been, owing to the value of the fish it has been fished for so continuously, that it is threatened with extinction although it has great fecundity. Could anything demonstrate more clearly the value of artificial propagation than the two examples above quoted.

When the first Pennsylvania Fish Commission began its work in the early seventies its methods were crude, not only from lack of facilities and absence of proved methods, but also it was hampered by lack of funds for the Legislature did not share the enthusiasm of the members of the Commission in regard to the possibilities of increasing a valuable food supply by helping Nature. The first employes of the commission were therefore expected to be workers in every direction. They dug the ponds and did all the labor on the place while at the same time they were expected to attend to the fish. That they were able to get men to do this work is rather surprising to the people of this day, but they did and the result is shown by the fact that Pennsylvania has to-day a corps of hatchery Superintendents all trained in this school, which has no superiors in the country.

But such a school is not desirable in these days for what is needed in the fish culturists is more brains and mental training than muscle, because the muscle when needed is always available from the unskilled labor of the country, while to-day the Department does not know where to turn in an emergency that would demand the skilled culturist. Fish culture to-day is an exact science and the successful fish culturists must be a man with an education that will make him observant and understand the advantages of training. The better

education and mental training a man has the better fish culturist he will make, the same rule applying to him as it does to the lawyer or the doctor.

To-day the need of the hatcheries is a larger force of trained men who would be available at any time to respond to any call. The splendid facilities of the Department for supplying fish will be wasted to a great extent if it does not have the force to use those facilities to the limit. These men should be a permanent corps, always ready to respond to calls, because now when there is a demand for helpers there are none available and the untrained man is no use even as a messenger because it requires a man with a knowledge of fish life to carry fish in cans for hours and not let them die. The Department, of course, has been hampered in the past in getting suitable men from the small amount of salaries it has been able to pay. A salary of fifty dollars a month to begin with and a prospective rise in the future to seventy-five dollars a month is not a very enticing prospect to a high school or college graduate who has aspirations in the way of learning to be a fish culturist and when he does come under the employ of the Department as soon as he becomes proficient he is enticed away by the offer of a higher salary.

To the lover of Nature there is no more attractive pursuit than that of fish culture, and it becomes more fascinating every day as its possibilities are developed. The Department of Forestry has established a school for the training of young men in the scientific part of forestry and the work it is doing is admitted to be most important. Why then should there not be established a school for educating men in the lore of fish culture. It is admitted that fish are among the most important sources of food supply and the man who can make two fish grow where only one grew before is as much a benefactor to his race as the man who makes two blades of grass grow where only one did before. In view of the importance of this subject the Department proposes to establish such a training school though at first only in a modest sort of way. When the contemplated improvements at the Wayne hatchery are all completed it is designed to take on there a few assistants with a view of giving them such a complete training that they will be fitted for any work in the Department from the care of the fish in the hatchery to the gathering of fish in the field.

The Wayne hatchery is peculiarly well fitted for this work as every branch of fish cultural work can be studied there. In the hatchery the student can learn trout culture and battery work, in the ponds he can study pond culture and the many lakes in the neighborhood give every opportunity to study field work. It is hoped that the scheme may prove attractive to bright young men and that they will avail themselves of the opportunity to qualify themselves for the profession which is growing in importance every day, because there is no question that the opportunities offered by the raising of fish for market will attract capital and that capital will need the trained fish culturist to make his venture a success.

If Pennsylvania is to get out of its hatcheries all that they are capable of doing she must increase her force of trained men who will be induced to stay in the service by making their salaries at least the same as any one else will pay. It will be economy to do this

because then the hatcheries can be worked to the limit of their capacities and the results will far more than balance the increased expense. What the people want is fish and the Department feels that it can give them all the fish they want if it only has the employees to do the work but these employees must be trained so that there may be no accidents due to lack of knowledge and no losses due to the same cause. A sudden stoppage in the water supply may mean the death of thousands of fish in the troughs or millions in the batteries and an ignorant messenger may arrive at his destination with nothing but dead fish in his cans.

The Wayne hatchery is peculiarly fitted for a school for the teaching of fish culture. It is situated at Pleasant Mount, Wayne County, a section of the lake region of Pennsylvania, and there are many lakes within easy reach of the hatchery. These lakes are all capable of being made to teem with fish which cannot be exhausted if wasteful and destructive methods of fishing are prohibited. Experiments made during the last few years absolutely prove this. Here then is the broadest kind of field for what is called field work, that is using these lakes as breeding places from which the rest of the State can be supplied while the field work increases the fish in the lakes by the constant change of blood, for fish deteriorate by inbreeding. The fish in these lakes are the pickerel, the basses, sunfish, yellow perch, catfish and minnows, the latter so much needed for food for the other fish. These are the fish which are the main reliance in restocking and keeping up the supply of fish in the waters of the Commonwealth. The taking of these fish is done by what is called field work and it is by this field work that by far the larger part of the restocking of the streams of the State is accomplished, as is also the replenishing of the waters of Lake Erie, in the latter instance the fish are all gathered by field work and the fish saved from what would otherwise be entirely waste product.

Hence the importance of field work and it can be thoroughly learned in all its parts by the student at Wayne hatchery. In addition as the student works on the lakes he can study the habits and life of the fish in its native element free from any artificial surroundings and train himself to those close habits of observation so necessary to the successful fish culturist. Then to the fish in the lakes is added the frogs from whose annual spawning it is possible to obtain as many eggs to hatch for tadpoles as there are required by the most exacting demands, the number to be had being limited only by the ability of the field men to handle them. It is a curious fact that there never seem to be any more than a certain number of frogs in a given pond and this number does not seem to vary no matter how many of the spawn may be taken away to a hatchery to be sent somewhere else when they become tadpoles. There is a growing demand for artificial cultivation of frogs but the data in regard to their life is yet insufficient to give the matter a standing above the experimental stage. The student at the school who has an interest in his work may be able to work out the problem of frog life that cultivators may take hold of the business with the same certainty that does the raiser of trout. With frogs commanding forty cents a pound and an ever ready market the business of raising them ought to be profitable if the secret of their lives is found out.

The hatchery also has in connection with it a trout hatchery with all the modern appliances and the student can become proficient in all the secrets of raising trout, from the taking of the eggs from the female fish, the impregnation of the same by the milt of the male, the placing on the trays and the control of the water, for the man at the spigot is as important as the man behind the gun. Too much water is as fatal at times as too little. Then too there is a battery for the hatching of the eggs of such fish as the perch, the catfish and all the commercial fish from Lake Erie, and here knowledge, judgment and watchfulness come into full play. No mere prentice hand can successfully do the work here for surmise and guessing cannot take the place of knowledge. No two kinds of fish eggs in a battery can be handled the same way and it was only after long study and experiment that the problem was solved at all. The splendid practical training of the Superintendents of the Pennsylvania hatcheries has stood them in good stead in many an experiment in handling the various kinds of fish eggs in the batteries.

The Wayne hatchery has the largest area of ponds by far of any of the other hatcheries and this makes possible the raising of the black bass, the fish so much demanded by sportsmen, the demand exceeding that for trout. The black bass cannot be handled as other fish by taking the roe but must be allowed to breed naturally and experience has shown that to successfully raise bass large areas of water are necessary. Supplementing the ponds which cover a number of acres the hatchery has control of the Beaver Flow reservoir, at one time a feeder of the Delaware and Hudson Canal, and this covers about two hundred acres. Here is ample space for the bass to grow and thrive but it will be made an object lesson as to what can be accomplished in the way of stocking, and keeping stocked, a body of water so that if no method of fishing, except a rod and line, is permitted the supply of fish will be inexhaustible and every fisherman will be able to every day get his legal number of fish. The bass problem is a most interesting one but the Pennsylvania Department has in the last few years done much to solve it and successfully raised the little fish to the length of several inches, something before thought impossible owing to the cannibalistic character of the fish. With the Wayne facilities the student will have most ample opportunity to study the life of the bass as he could do no where else.

A graduate of the proposed school if he takes an interest in his studies and avails himself of all his opportunities will at the end of his term be fitted to fill with credit any position in a fish hatchery and be able to give the Commonwealth of Pennsylvania those results the Department of Fisheries is so anxious to attain.

FIELD WORK.

One of the most important adjuncts in the propagation of fish for restocking the waters of Pennsylvania is what is termed "Field Work;" that is gathering the fish or spawn from various waters of the State and transplanting them to other waters, thereby securing millions of fish that otherwise would be lost and at the same time infusing new blood. This is by no means an experiment, it having been tested for a number of years. Constant inbreeding results in the deterioration of fish the same as it results in human beings and animal life. The Japanese have for years been the most wonderful students of fish culture and by inbreeding have produced a scaleless fish, which is of itself a sign of weakness.

In some sections where the field work is being done there come complaints that the Department of Fisheries is robbing the waters of fish that should be left for the use of the dwellers in the neighborhood. This charge of robbery is without foundation, as the work is beneficial inasmuch as it takes the fish from one water to another, thereby infusing new blood in the fish in the water to which the new fish are brought and other fish are taken back to the first water to replace those removed, thereby infusing new blood in that place. As remarked above, this practice is no longer an experiment but a decided success, having been tried various times within the last few years in various lakes in Northeastern Pennsylvania where the field work has been more largely carried on than in any other section of the State except on Lake Erie.

There are fish like the yellow perch for instance, which deposit their eggs in long strings, attaching them to branches whose movement by the wind and water keeps up the movement necessary for the successful hatching of the eggs. The yellow perch is most prolific and the annual deposit of the eggs runs into the hundreds of millions. Storms drive the eggs ashore in incalculable numbers where they are left to die and the lashing waters cover the strings of eggs with mud smothering the eggs. If these eggs are gathered in time and taken to the hatchery they can be hatched out, the percentage running from seventy to ninety-five per cent. The supply of eggs is limitless and therefore the number of eggs that can be gathered by field work is only limited by the number of men that can be employed to do the work.

Catfish lay their eggs in holes where they can be readily gathered by the field men, and where in too many cases, if left to nature's work, the eggs are smothered by mud or devoured by snakes and other predaceous creatures. The experiment at Torresdale, which is reported by the Superintendent, shows that in the case of catfish, as in the case of yellow perch, the number of eggs that can be gathered is limited only by the number of men that can be put to work to gather them.

On Lake Erie the field work means the gathering of hundreds of millions of eggs that otherwise would be entirely lost. The commercial fishermen on the Lake are always ready to co-operate with

the Department of Fisheries in gathering these eggs as they fully appreciate the benefits to be derived. The eggs taken from the fish of the commercial fishermen would be all wasted if it were not for the work of the Department. The eggs are taken from the ripe fish and sent to the hatchery to be hatched. The work of the men on field duty is best done by men who are trained to it and the Department has heretofore been much hampered in its work owing to its inability to obtain trained men, it being impossible to secure men for short periods of time. What is imperatively needed by the Department is such liberal appropriation that it can employ by the year men who can be sent to any part of the State to do the field work.

Besides gathering the eggs the field men also gather the fingerling fish from various waters for transplanting to other waters, this being the case with such fish as pickerel. Field men also gather the breeding fish of the bass and yellow perch to be placed in the ponds at the hatcheries for breeding purposes.

BROOK TROUT.

The gorgeous colored brook trout of Pennsylvania is the favorite fish of the angler, and every Spring crowds of fishermen hasten to the streams to fish for these dandies of the Pennsylvania waters. There are still many trout streams in Pennsylvania that afford full creels to the angler, but with the ever increasing army of fishermen it is absolutely essential that the supply must be kept up by restocking with artificially raised fish, because the streams under natural propagation will not furnish fish equal to the demand, because natural propagation in any streams is really but a small factor when the number of fishermen is considered.

BROWN TROUT.

With the warming of the waters of the State through the clearing off of the timber, there are many former trout streams that are no longer cold enough for the fastidious brook trout. In such waters, experience shows that the brown trout will thrive, and while not so gamey as the brook trout, yet they afford really more sport to more people than the brook trout, because the streams are more accessible and less difficult to fish.

The brown trout have been called the German brown trout, because they happened to be introduced to this country by a German, yet the fact is that these brown trout are the English brook trout,

over which Isaak Walton so much rhapsodized. The Department is making every effort to be able to furnish all the demands for brown trout, and is increasing yearly the number of its breeders so that the output of fish will equal the demand upon it. The Department knows of no other persons raising brown trout and therefore has to depend upon its own supply of breeders for its young fish.

MUSCALLONGE.

Through the co-operation with the New York Conservation Commission, the Department of Fisheries was again enabled to obtain a supply of muscallonge eggs from Chatauqua Lake, New York. These eggs were hatched and the fish were planted in those western lakes in which the muscallonge was already an inhabitant. The Muscallonge is a most rapid grower attaining a size of 12 inches in a very few months, but to attain this size he eats an enormous lot of food, causing him to be a dangerous fish to place in ordinary waters. Jordan and Evermann say that a full size muscallonge represents several tons of fish which he has devoured during his life time.

The ardent angler desires the muscallonge on account of his size and the hard fight he puts up when hooked, but where the muscallonge abound in small streams, very few other fish are found, so that when the take of the year is measured by fish in pounds, the yield of muscallonge is far below in the way of food than the amount taken from waters where the muscallonge does not live.

PIKE PERCH.

The pike perch, or as it is known in Lake Erie, the yellow pike, and in the inland waters as the Susquehanna salmon, are a valuable fish, both from a commercial point of view and as a game fish. In Lake Erie they are classified as food fish, while in the inland waters of the State they are classified as game fish.

Last year, through co-operation with the Conservation Commission of New York, the Department was able to obtain a supply of pike perch eggs from Constantia, New York. These eggs were in prime condition, due, as is shown by the reports of the Superintendents of Pennsylvania hatcheries, to the care with which the eggs were handled at the New York station. The reports of the catch of Susquehanna salmon in the rivers of the State show good catches and the fish of fine size.

FROGS.

The experience of the Department has shown that to raise frogs large areas of water are necessary, and such areas of water the Department does not have. It has been successful in a small way in raising frogs at some of the hatcheries, but it finds it is much more satisfactory to gather the spawn and tadpoles by field work, and then ship the frogs to the applicants. There seems to be no limit to the amount of frog spawn that can be gathered, and no matter how many millions of spawn is gathered, there seems to be no diminution of frogs at the source of supply.

The Department would suggest the enactment of a better law in regard to the protection of frogs, as the present act is not entirely satisfactory.

MINNOWS.

One of the necessities for the successful stocking of the streams and waters of the State with fish is a plentiful supply of food. The water plants make the gardens that furnish the food for the little fish, but as the fish advance in size they need more than microscopic food. The greatest source of a supply of food for most fish is the minnow family and in the original balance established by nature the supply of minnows was equal to the demand of the fish population of the waters. Of late years, however, this balance has been destroyed which is partly due to the introduction of other fish such as carp and bass which destroyed the previous balance established by nature. The fishermen also are in a great measure responsible for the diminution in the supply of minnows because they draw on them for bait and waste many more than they use. In the absence of minnows the fish prey upon their own young and this is plainly shown in small streams that have been stocked with bass.

The Department is prepared to supply minnows for stocking the streams upon application.

THE SHAD.

To discuss this question properly it is necessary to go back to the time when there were no obstructions in our rivers and when the farmers and others for a distance of fifty miles on each side made their yearly pilgrimage to the streams in April and May to secure

their fish food for the ensuing summer. In those early days they would flock to the riverside and wait for the drawing of the seines and on the banks of the stream they would clean and salt down one, two or three barrels of shad as might be required for the summer supply for their families.

There were then, comparatively speaking, but few inhabitants along the rivers, but since then conditions have changed wonderfully, one of the first obstructions being the settling of a thickly populated country. Then came the erection of industrial establishments and mining operations, all emptying the pollution from their plants into the stream, contaminating it and destroying the natural spawning grounds of the shad through the depositing of coal culm from the mines into its entrance to the Bay.

Another was the erection of dams and this applies to all rivers inhabited by shad. It is a known fact that as soon as dams are erected the disappearance of the shad above and below the dam is noticed, and while there has been much study on the question and many efforts to construct a practical and adequate fishway for the ascension of shad, up to this time none have been found to be practical. In the early part of the present century before the construction of dams the shad fisheries of the Susquehanna river were among the most important on the Atlantic coast.

The Susquehanna river is situated partly in Maryland and New York, but principally in Pennsylvania, traversing this State from its northern to its southern border. Its source is in Otsego Lake, New York, from whence it flows a distance of 422 miles to its entrance into the Chesapeake Bay.

Another serious matter that has to be taken into consideration is the impossibility of getting concurrent legislation with Maryland which would give Pennsylvania a chance to harvest some of the crop it sows. There is one thing sure and that is unless there is a practical and adequate fishway placed in the dam in the river between this and the State of Maryland and the pollution of the waters is abated and the necessary concurrent legislation is enacted the shad industry will be greatly interfered with.

There was also a very noticeable decrease this year in the catch of shad in the Delaware river. The Department has the same conditions to meet in its endeavor to replenish the shad in the Delaware river as it has in the Susquehanna, namely, pollution and failure to get uniform laws with the State of Delaware and it is the consensus of opinion that the scarcity of shad in a great measure is due to these conditions. The Department of Fisheries, however, is bending every effort to keep up this supply of shad and has established at Torresdale on the Delaware a shad hatching station, and believes it to be the only State doing anything in the way of shad propagation for the Delaware.

The hatchery at Torresdale has facilities to hatch a great many more million eggs than it does if it was able to collect them and it does collect every available shad egg on the Delaware for many miles and will continue this work so long as it is able to collect any eggs in the hope that in years to come the river will be in better shape at least so far as pollution is concerned.

BLACK BASS.

The Department of Fisheries has the gratified feeling that it has solved the problem of propagating black bass. These fish cannot be propagated as trout, but must be allowed to build their nests and lay their eggs naturally. For this purpose it is found that large areas of water are necessary, and the Department has done much in securing such areas and is still working in that line.

A series of experiments has shown the possibility of teaching the little bass to feed, and educating them up to the knowledge that they can do just as well on the artificial food as they can by eating each other. The Department has been able to hold these bass without an appreciable loss until they reach a length of from three and a half to seven inches, at which size when planted in the streams they are fully able to take care of themselves, and at the same time by their fine appearance afford much satisfaction to the recipients of the fish.

There is an exceedingly large demand for the black bass, but the Department is exercising its discretion in shipping the bass to waters that are not suitable for them. The small mouth bass requires large areas of water and is a destructive fish, not only being very voracious, but is also given to killing fish for the mere sport of it, as any observer can note by watching the black bass chasing a school of minnows.

The Department therefore recommends persons who apply for bass for small areas of water to change their application for other fish which are not so destructive, and in time will give better results, that is more fish and more pounds of food.

WHITE FISH.

The Department has been dependent largely upon the station of the United States Bureau of Fisheries at Put-In-Bay, Ohio, for its supply of white fish eggs, but this has not been entirely satisfactory owing to the lack of care in preparing the eggs before they are shipped to the Erie station. Bad weather has also cut off the supply of fish at that station, so this year, through the courtesy of the fishery officials of the Province of Ontario, the Department has been able to obtain a supply of white fish eggs from the Canadian fisheries. There eggs were handled by the Department's own employes, and they arrived at the Pennsylvania hatcheries in a first class condition, the large percentage of the eggs hatching, showing the advantage of the carefully handling of eggs before shipment.

While it is not many years ago since the white fish industry in Lake Erie was so poor that it did not pay the fishermen to fish for them, under the restocking that has been done by the United States Government and the Pennsylvania Department of Fisheries, the supply of white fish has again grown to large proportions. During the year past the Erie fishermen report the best fishing for white fish in years, some of the boats bringing in seven thousand pounds at a haul. This is a most encouraging showing and has convinced the fishermen of Lake Erie that if they wish to keep in business they must co-operate with the Department in this work of artificial propagation.

LAKE HERRING.

Cisco or lake herring are much the most valuable fish in the Pennsylvania waters as we have our own fields in our own waters where the fish can be taken. For the last two years the Department has made strenuous efforts to collect the eggs of this fish, and this year there were more eggs of lake herring taken than ever before by many millions. The fish are taken by the gill net fishermen who now co-operate eagerly with the Department, furnishing every facility for getting the eggs.

The lake herring is very much like the white fish but not so large. Its enormous numbers make it a most valuable adjunct to the food supply. The lake herring will take the hook, and fifteen years ago they were caught in Presque Isle Bay through the ice, but since the Bay has become so polluted with sewage the herring no longer come into the Bay.

BLUEGILL SUNFISH.

There are few fish which afford so much entertainment and sport as do the family of sunfish, this being especially true as to women and children to whom the taking of sunfish is an ever continuous joy and delight. There are quite a number of species of these fish varying in size, but all of them are gamey and ever ready to take the hook, thus giving the amateur a chance, which he gets from few or no other fish.

The aristocrat of the sunfish family is the bluegill sunfish, which abounds in Lake Erie. This fish grows from three quarters of a

pound to a pound in weight, and as an edible fish has no superior, while it is so gamey within certain limits that the daintiest fly fisher does not disdain to fish for it for sport. It is very productive and will thrive in any pure water. Its very gameness is, however, against it as it will rush for a hook when it is barely an inch long and will return again and again to be taken if thrown back into the water, seeming to learn nothing by experience.

Appreciating the value of this fish for food and sport, the Department is making great efforts to raise the bluegill in quantities so that they may be disseminated in all the waters of the State. There are many small bodies of water in the State which would render large returns in the way of food if restocked with the bluegills instead of the black bass, which the average person seems to think would be the fish that he wants in the water. The yield of bluegills would be thousands of pounds in a year where it would not be hundreds of pounds if black bass were planted. In the case of the bluegills, it not only means more food, but more sport for more people.

CATFISH.

The catfish needs no introduction to the average boy, and the grownup recalls with pleasure the days when he went fishing for catfish. The catfish thrives in most any waters, even if not the purest, and he shows a family instinct that is to be commended to other members of the fish family. The catfish watches over their eggs, and after the little fish are hatched they round them up in a ball after the manner of the western cowboy rounding up his cattle, and guards them with a courage as energetic and persistent as the care with which he watched over their eggs.

During the past year the Department has been experimenting with the propagation of catfish, and it feels sure that it will soon be in a position to furnish an inexhaustible supply of these fish.

Owing to the habits of the catfish to seek shoal water to lay its eggs, millions of these fish perish annually by their eggs being left stranded. These eggs are now gathered by the field men and hatched in the batteries at the hatcheries. The eggs hatch in about five days and the yield of fish is very good. The little ones are pink in color when first hatched, and true to their family instinct, roll around in balls until they attain a certain size when they separate.

Catfish and waffles were at one time one of the attractions for visitors at Philadelphia, and by once more making these fish abundant the Department hopes to place catfish and waffles within the reach of every one who will take the trouble to go fishing.

The experience of the Department has been that the best catfish for Pennsylvania waters are the native catfish or bull head. They thrive and do better than the imported fish, but do not attain the

size of some of the other catfish which some persons desire to introduce. The policy of the Department is to go slow on introducing any new fish into the waters of the Commonwealth, because experience has proved that such fish are not entirely desirable, as shown in the case of the German carp.

BLUE PIKE.

There was a heavy run of blue pike this year and the Department has been able to secure a good supply of eggs. The blue pike are most largely caught in this end of the lake and rarely in the upper end. They are fully equal to the yellow pike as food. For a number of years such prominent ichthyologists as David Starr Jordan insisted that blue pike and yellow pike were the same fish as ichthyologists class fish. Within a few years the Department has convinced these scientists that the fish are different, as the blue pike is distinguished by its color and by the fact that it does not spawn at the same time as the yellow pike.

YELLOW PERCH.

One of the daintiest of fresh water food fishes is the yellow perch, and it is one of the few fish that survived from the Devonian period. Owing to its fecundity it abounds in such large numbers in some of the northeastern lakes that they are considered a nuisance by the angler who thinks that black bass are the only foeman worthy of his steel. These fish thrive and do well in almost any pure waters, though hardly so well in rapidly running waters.

The Department hopes with its completed hatcheries to be able to furnish the waters of the State with an abundant supply of this valuable fish. What can be done by heavy stocking is shown by Presque Isle Bay at Erie, where yellow perch have been planted heavily for several years, the result being that the hundreds of fishermen who daily frequent the Bay are rewarded with large strings of the yellow perch.

In its bulletin, what an acre of water will do, the Department recommends the yellow perch as one of two fish which will be most profitable for the farmer to raise.

HATCHERY REPORTS.

The reports of the Superintendents of the various hatcheries give in detail the work at the hatcheries during the past year. The Superintendents labored under many disadvantages, some owing to the work of reconstruction which was going on, and others because the Department does not have the absolute control of the water supply.

By their unswerving loyalty and persistent energy they produced results greater than was hoped for, and the Department returns to them its most hearty thanks. Indeed, the Commonwealth of Pennsylvania is to be congratulated upon its force of Superintendents of hatcheries who are not excelled in fish lore and ability by the force of any other State. They have all been in the service many years, and with one exception, were all trained in the old finished school, which expected an employe of a hatchery to be ready to do any work, from digging a pond to taking eggs from a fish.

It is a hard school, but a thorough one, but as before remarked in this report, it is no longer the proper system of education to be followed for a fish culturist. The fish culturist to-day is a man of science whose brains count for more than his muscle, and the work of the muscle can be done by the laborer who is not expected to employ much brain power.

CORRY HATCHERY.

Corry, Pa., November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—I have the honor to herewith submit my annual report covering operations of the Corry Hatchery for the year ending November 30, 1915.

As most of the permanent work was completed at this hatchery I was able to go ahead with the propagation of trout without any interference and was successful in rearing and distributing a large number of young fish to all parts of the State.

The shipments of fish seemed to have been most successful from this hatchery, which is very gratifying to me. I have endeavored at all times to get the fish to their destination in the best possible condition.

I have been at this hatchery for thirty-five years and think I know its capabilities for raising trout. I have visited many hatcheries but have never seen one which is so well equipped.

One of the tribulations of the Superintendent of a hatchery is due to the depredations of fur and feathered creatures who have an appetite for trout. King fishers gather in such numbers around a pond that one wonders where they all come from while cranes and herons have a most wonderful taste for trout. Coons, minks, cats and even the house rat are fishers for trout, and as much vigilance is required to keep off these enemies as is said to be the price of liberty.

As the work at this plant has been the rearing and distribution of trout I herewith attach the distribution of fish during the year.

Respectfully,

WILLIAM BULLER,
Superintendent.

BROOK TROUT, ADULTS.

Crawford county,	26
Venango,	20
Total,	46

BROOK TROUT, TWO YEAR OLD.

Crawford county,	1,350
Erie county,	12,000
Elk county,	16,500
Jefferson county,	4,200
Venango county,	4,350
Warren county,	3,350
Total,	41,750

BROOK TROUT, YEARLING.

Bucks county,	4,500
Bradford county,	1,200
Clinton county,	28,500
Cumberland county,	6,000
Crawford county,	6,400
Cameron county,	19,800
Clarion county,	1,500
Clearfield county,	1,500
Elk county,	17,700
Erie county,	16,650
Fayette county,	3,600
Forest county,	4,200
Jefferson county,	15,600
Lehigh county,	1,800

Lackawanna county,	5,700
Luzerne county,	15,600
Lycoming county,	7,500
Lawrence county,	6,600
McKean county,	21,200
Mercer county,	1,200
Northampton county,	4,500
Potter county,	70,200
Schuylkill county,	4,500
Somerset county,	11,100
Sullivan county,	4,500
Tioga county,	6,600
Venango county,	12,300
Warren county,	30,600
Washington county,	2,400

Total, 333,450

BROWN TROUT, ADULTS.

Crawford county,	56
Lancaster county,	200
Total,	256

BROWN TROUT, YEARLING.

Carbon county,	5,400
Crawford county,	50
Mercer county,	900
Total,	6,350

LAKE TROUT, YEARLING.

Crawford county,	100
Carbon county,	9,000
Erie county,	7,000
Luzerne county,	27,000
Wyoming county,	3,600
Total,	46,700

EYED EGGS TO ERIE HATCHERY.

Erie county,	3,000
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SUMMARY.

Adult Brook Trout,	46
Two year old Brook Trout,	41,750
Yearling Brook Trout,	333,450
Adult Brown Trout,	256
Yearling Brown Trout,	6,350
Yearling Lake Trout,	46,700
Eyed Lake Trout Eggs,	3,000
Total,	431,546

REPORT OF BELLEFONTE HATCHERY.

Bellefonte, November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—I have the honor to submit my annual report covering the operations of this hatchery from December 1, 1914 to November 30, 1915:

At the beginning of the year the troughs at this hatchery were all filled with brook trout eggs in very fine condition and with prospects of getting a good hatch. At Christmas half of the troughs were filled with young fish and by the last of January all the troughs were full, with the exception of four, which were later filled with brown trout. In all my experience in fish cultural work I never saw a finer lot of young fish and am very much gratified with the work. Twenty-five troughs were feeding by about the middle of January.

In August the shipping of the young fish which had reached a length of from four to five inches was commenced. Some of the fish had obtained a length of six inches in November, which ought to afford excellent fishing during the coming season. In almost every case the recipients of the fish expressed to me their appreciation of the fine fish received, all being very well pleased with the size sent out under the present administration.

Most of the time last winter was taken up in making coverings for the ponds on the grounds, thereby making shade for the small fish in hot weather. Some of the old ponds on the hatchery grounds thirteen in number, were no longer fit to be used in the rearing of fish, and, working under directions from the Department, I had these ponds all torn out and in every place new ones built of concrete. A raceway 100 feet long built of 12 inch concrete walls, having concrete bottoms was built and new screens placed in the gates. Eleven of the rearing ponds having mud bottoms were reconstructed and concrete bottoms replaced the mud bottoms. Much grading, together with the extension of the lawn, trimming trees, etc., was done.

On August 1st, the distribution of trout was commenced and by the middle of August a large number of young fish ranging in size from four to five inches had been shipped out. These shipments were continued until the weather became so severe that it was not good policy to make further shipments, as it is the policy of the Department to have every shipment reach the applicant in the very best of condition.

The old frame hatching house which has stood at this hatchery for a great many years was torn down about the middle of August and replaced by a modern and up to date hatching house. The contract for the erection of this new hatching house was awarded to Gehret & Lambert, contractors of Bellefonte, and by the first of December the building was completed, accepted by the Department, and the water turned into the hatching troughs ready for use. The new



Bellefonte Fish Hatchery.

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Bellefonte Fish Hatchery.



Interior of Bellefonte Hatchery—showing hatching troughs.

building is absolutely fire proof, being constructed of concrete, brick and steel, and adds very much to the attractiveness of the grounds. The building is two stories high of very attractive design and will facilitate the work at this station.

New hatching troughs were made of cypress and placed in the hatchery ready for use. A new pipe line 200 feet long was laid to conduct the water from the spring direct to the ponds, as the water coming from the hatching house is not very favorable for the small fish.

The young trout shipped out from this hatchery were the finest fish ever distributed by me as Superintendent of this hatchery.

In conclusion I wish to express to you my sincere thanks for the hearty co-operation extended to me in my work during the past year. The distribution of fish follows:

BROOK TROUT, ONE YEAR OLD.

Fish shipped from December 1, 1914, to November 30, 1915.

Blair county,	16,800
Berks county,	5,100
Bradford county,	7,200
Bucks county,	10,800
Bedford county,	13,500
Cambria county,	26,000
Carbon county,	23,400
Centre county,	64,000
Chester county,	3,300
Clearfield county,	66,900
Clinton county,	21,000
Columbia county,	40,200
Cumberland county,	24,900
Dauphin county,	10,400
Elk county,	1,800
Erie county,	120,000
Fayette county,	15,000
Franklin county,	5,700
Fulton county,	4,500
Huntingdon county,	18,000
Indiana county,	9,400
Juniata county,	600
Lancaster county,	11,100
Lebanon county,	21,900
Lehigh county,	4,800
Luzerne county,	15,600
Lycoming county,	70,000
Mifflin county,	16,500
Montgomery county,	9,900
Montour county,	300
Northampton county,	23,400
Northumberland county,	7,800
Philadelphia county,	6,900
Schuylkill county,	61,200
Snyder county,	2,400

Somerset county,	26,100
Sullivan county,	17,000
Susquehanna county,	17,400
Tioga county,	1,200
Union county,	8,800
Westmoreland county,	6,900
Wyoming county,	2,100
Monroe county,	12,300
York county,	3,600
Total,	855,700

LAKE TROUT.

Sullivan county,	3,200
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ADULT BROOK TROUT.

Adams county,	150
Centre county,	325
Cambria county,	50
Monroe county,	2,000
Philadelphia county,	2,100
York county,	25
Total,	4,650

BROWN TROUT ADULTS.

Philadelphia county,	2,400
Wayne county,	650
Total,	3,050

GOLD FISH.

Wayne county,	25
Erie county,	30
Total,	55

BROWN TROUT, ONE YEAR OLD.

Blair county,	2,700
Chester county,	9,000
Centre county,	1,800
Cambria county,	2,700
Delaware county,	300
Huntingdon county,	600
Lackawanna county,	6,200
Luzerne county,	7,500
Lycoming county,	5,400
Lancaster county,	1,200
Mifflin county,	1,200
Monroe county,	1,200
Montgomery county,	300

Northampton county,	1,800
Philadelphia county,	2,700
Wayne county,	4,500
Wyoming county,	1,500
Westmoreland county,	3,000
Total,	53,600

Respectfully,

WILLIAM F. HAAS,
Superintendent.

REPORT OF THE WAYNE COUNTY HATCHERY.

Pleasant Mount, November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—Herewith is my report of the operations of the Wayne County Hatchery for the year ending November 30, 1915:

On account of the entire reconstruction of this hatchery plant, which is a stupendous task along the lines formulated by you, there has not been as much attention given to the propagation of fish and field work from this point as would have been if this work was not to be completed.

During the winter months the time of the men connected with the hatchery was devoted to the taking care of the brook and lake trout eggs which were in course of development in the old building, and when the weather permitted they hauled stone to be used in consturction of walls and to the crusher plant. I would recommend that there be not much attempt made to propagate other species of fish at this hatchery except in that portion of the hatchery which is completed for trout work, until after the completion of the plant.

The construction of the large ponds for bass seriously interferes with that branch of the work and it is useless to attempt to do this unless the ponds are fully completed, as experience has shown that unless provision is made that there is absolutely no leakage and the supply of water entering the ponds can be so arranged as to prevent other fishes from getting in, no results will be obtained. The attempt to hold the young bass in the incompleated ponds this year was a total failure.

The contracts for the erection of a new hatchery building at this station to be finished and ready for occupancy the first day of Novem-

ber is still in an incomplete stage on account of the contractor not putting on a sufficient force of men, and I would recommend that some drastic action be taken in this matter in the spring so as to complete the building at as early a date as possible as it seriously interferes with the work at this hatchery by not having it completed and as a result of its not being completed I will again be compelled to use the old hatching house which is in a very dilapidated condition and unfit for men to work in.

I would recommend that the same action be taken in the contract for the completion of the aqueduct and series of trout ponds which are very badly needed.

Much work has been done with the small force of men under my control in excavating and completing dams No. 4 and 5. The work on dam No. 4 consisted of leveling and deepening the bottom, building an entire embankment along the eastern side, erecting a concrete wall approximately 100 feet long and five feet high, with a catch basin to conduct the water from springs on the east side of the dam through a wooden pipe line, which is laid beneath the bottom for a distance of about 500 feet to connect with a catch basin entering the aqueduct that is intended when finished to supply the hatchery and the series of trout ponds with a supply of water.

There have also been constructed massive bulkheads and gates between dams No. 4 and 5. The work on dam No. 5 has been of the same character as that of dam No. 4. There has also been constructed a massive bulkhead of concrete in this dam. There has also been a great many stones and other material hauled during the summer which will be used in completing the series of four large bass ponds. This work could have progressed faster if I was allowed more men and teams, but as the appropriations are limited the work must naturally go slow, but I find it will be to the best interests to do this work thoroughly while it is underway and when it is completed it will be permanent.

The propagation of trout in the limited space at my command has really exceeded my expectation.

The field work which is usually carried on from this station has also been interfered with on account of this construction work, the teams which are usually used for the field work being used in the construction work.

There have been completed by contract a dam and fishway and bulkhead on the north line of the property which supplies the water to the ponds; also two other dams in the Lackawaxen river which conducts the water into the different series of ponds. I have carried out the plan which was formulated by you in having a series of dams erected with fishways extending through the whole length of the property which form natural trout pools and at the same time gives a head of water at each supply station. These dams and bulkheads are of massive concrete work and conform to the plans and specifications in every way.

There was also constructed by contract a beautiful concrete entranceway and walk leading from the public highway across the lawn to the front entrance of the dwelling; also a concrete entranceway to the rear entrance of the dwelling, leading from the public highway to the hatchery, a concrete walk from the dwelling to the barn and a concrete areaway surrounding the cellar entrance. The lawn from

the rear of the dwelling surrounding the building and facing the public highway has been completed and presents a very attractive appearance. I would suggest that when the barn is completed that you allow me to concrete and finish the lawn from the rear of the dwelling to the rear of the barn.

The contracts for concrete work which were let to the Hagen Lumber Company have conformed in every respect to the plans and specifications and their workmanship was done in an efficient manner and presents a very attractive appearance since being finished.

The following is a table of the distribution from this hatchery, also the collection from the field during the month of April:

54,600,000 yellow perch eggs which were disposed of in the following manner:

37,800,000 were sent to the Erie hatchery at Erie, Pa.

16,800,000 to the Union City hatchery.

1,000 adult pickerel were planted in Bigelow Lake in Wayne County. These pickerel was an accumulation and were reared in some of the ponds at the hatchery. There were 300 adult bass also planted in Bigelow Lake.

Distribution of Brook Trout by Counties.

The trout distributed from this station for public waters were one year old.

Luzerne county,	33,950
Monroe county,	27,700
Lackawanna county,	10,500
Wayne county,	33,500
Pike county,	6,500
Susquehanna county,	10,500
Fairmount Park Aquarium, adult brook trout,	25
Fairmount Park Aquarium, adult brown trout,	25

Distribution of Lake Trout One Year Old.

Lake Poyntelle,	75,000
Long Pond,	50,000
Rock Lake,	30,000
Bigelow Lake,	40,000

Pike Perch advanced fry received from the Union City hatchery for distribution:

Bigelow Lake,	150,000
Sly Lake,	150,000
Long Pond,	150,000
Still Water,	50,000

Receipts.

On February 3d, 200,000 lake trout eggs were received from Duluth, Minnesota.

February 13th, 630 adult brown trout were received from the Bellefonte hatchery.

February 27th, 200,000 eyed brook trout eggs were received from the Penn Forest Brook Trout Company.

December 15th, 30,000 eyed brook trout eggs were received from Weissport.

December 21 and 23d, 400,000 eyed wild brook trout eggs were received from Bar Mills, Maine.

Respectfully,

G. W. BULLER,
Superintendent.

REPORT OF TORRESDALE HATCHERY.

Torresdale, Pa., November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—I have the honor to herewith submit my report covering the operations of the Torresdale Fish Hatchery for the year ending November 30, 1915:

As there were no white fish or herring eggs received from the Erie Hatchery the work of fitting up the new hatching house was started. The concrete floors were all treated with a hardening preparation, after which the floors were painted. The walls and ceiling of the hatching house were all enameled white, also two McDonald Hatching Batteries. These batteries are of the latest type and up to date in every respect. This gives the interior of the hatchery a very neat and pleasing appearance and conforms with the architectural beauty of the exterior of the building.

For several years there were stored at this hatchery nine tanks which were in very bad condition. After making the repairs to the tanks they were placed on the second floor in the hatching house and connected up with running water and were filled with different kinds of brood fish which are reared at this hatchery for exhibition purposes. They attracted considerable attention and were admired by a great many visitors and school children of this city. As soon as the water in the tanks began to get warm in the summer months the glass in the tanks began to break one after another until they were all in such condition to be practically useless. In my opinion this was due to the tanks being exposed to the weather for so long a period and after the water was run into them and became warm this caused a swelling and warping of the wood which naturally caused the glass to break. Following advice from the Department there was nothing more done with them as it was deemed advisable not to repair them.

During the mild weather of the winter months much work was done in filling and grading around the new hatchery building. Cinders were drawn from the filter plant which is located close by for this purpose. The old hatching house was dismantled after the new house was completed and ready for occupancy. The shed which covered the boiler and pumps was allowed to stand as protection to the boiler and pumps as they are to be used to provide for the safety of the water in the hatching house until other arrangements can be made. Ice was cut from one of the ponds and stored away in the old spring house and this ice lasted until after the spring shipping. All of the dead trees and shrubbery were cleared away and much work done on the grounds to make it more attractive.

The first yellow perch eggs were gathered from the brood pond on March 30th and after that eggs were gathered nearly every day until after the spawning season. There were a goodly number of eggs collected from the hatchery pond. There were also a fine lot of eggs collected from Bristol Lake and some from Pennypack Creek. The water was very clear and calm during the spawning season of the perch which made it very easy to gather the eggs. Very few strings of eggs were found that were smothered. On the 4th of May there were ten million yellow perch eggs received from the Superintendent of the Wayne County Fish Hatchery. The eggs coming through in very fine condition and were hatched at this station with practically no loss. Most of the fry of the yellow perch was planted under instructions from the Department, in the waters of the Delaware, Susquehanna and Schuylkill Rivers and their tributaries. A large number of perch fry were placed in the large brood pond on the hatchery grounds. The fry cared for during the summer months grew to a length of from two to three inches. On the morning of August 3d we experienced a very heavy rain which caused the stream running through the hatchery grounds to raise to such extent that it overflowed its banks and the greater part of the yellow perch were carried by the swift flow of water through the screens into the Delaware River. A great many of them were ground up on the screens at the overflow of the pond, as they were not able to hold themselves in the swift current. The adult fish being stronger than the young fish were able to hold their own in the swift current and no harm came to them.

The pike perch eggs received from the Wayne County Fish Hatchery on April 27th were very fine eggs, and were received in the very best of condition. After they were placed in the hatching jars some of them did not have to be screened through the period of incubation and were hatched out with very small loss. The applications on file at this station for this species were all filled and a very nice plant of the fry was made in the upper Delaware River. There were a number of fine specimens of pike perch caught in the lower Delaware River during the shad and herring season and I think that if the Department continues to plant a portion of the pike perch fry in the Delaware River from year to year, it will only be a short time before the catches of pike perch in the Delaware River will equal the catches made in the Susquehanna River.

The first shad eggs were collected from the Delaware River on the evening of April 23d, after this the eggs continued to come in very

slow throughout the season as the water in the river remained very cold until the close of the fishing season. The shad season was one of the poorest that has been experienced in a number of years, and it is the consensus of opinion of the fishermen that this was due to the extremely cold water. The catch of shad in the South was also reported to be small, being credited to the cold water and unchanged weather conditions. Some of the shad fishermen would make several drifts without catching a single shad; the returns being so small that it did not pay for the nets used.

There was a report circulated last winter that a steamship captain reported that he had struck a school of dead shad out in the Gulf Stream, running his boat through them for two days and one night. He said this was caused by an earthquake shock. A few of the fishermen are of the opinion that the shad at that particular time of the year were all out in the Gulf Stream in one big school and were all killed at one time.

All the shad eggs were collected which were possible to get and after they were hatched out the young shad were so weak that a great many of them would cling to the bottom of the hatching jar. The water from one of the brood ponds was run into the hatching house during the incubation of shad; this water being from two to three degrees warmer than the water taken from the river. On account of the weak fry of the shad, caused by the cold water, it was deemed best to plant them in the lower Delaware River. They were placed on the "Yacht Anna" and distributed in the river between the hatchery and Neshoming Creek.

There are two reasons why I think the scarcity of shad was due to the water and weather conditions. First—As both the shad and the river herring come into the river to spawn in the spring of the year, and this year there was a scarcity of both shad and herring; it appears to me very strange that two varieties of fish would drop off to such an extent in the same year, unless it was caused by unnatural conditions. Second—We all know that the shad is a salt water fish but comes into the fresh water to deposit its eggs and after the eggs are deposited it returns to its home in the salt water. We also know that nature has provided the fish with a certain amount of instinct and if the waters of the rivers are too cold to allow the hatching of their eggs and the development of the young fish, the adult fish will naturally hunt other waters which are suitable for them to deposit their eggs, or they will spawn at sea. I am of the opinion that the shad came up to the inlets of the rivers and finding unnatural conditions waited for these conditions to change but had to wait for so long that they deposited their spawn at sea.

After the close of the shad season, June 10th, through the interest taken by the Department in securing all the shad eggs possible, the season was extended to the fishermen on the river ten days for the purpose of securing the spawn of the shad. This ten-day extension produced no results as there were not fifty adult shad caught during the ten-days period.

After the shad season closed the work of the catfish was taken up. This work of hatching the catfish is very interesting. The brood fish in the ponds are allowed to spawn and hatch naturally. After the little fish are hatched each brood is kept separate by the male

and female catfish. No matter how many families there are in one pond you will always see each litter by itself. Should they become separated in case of fright, the parent fish soon sort out their young. The feeding and caring of the young fish reminds you of a poultry man caring for his different flocks of chicks.

The work of gathering the catfish eggs from the meadows along the river has proven to be a big success and from year to year better results are being obtained. This work has only been carried on during the last two years and should be taken up more extensively at this hatchery. The greater part of the eggs gathered from the field are deposited in such places that they would be left high and dry at low tide or devoured by the birds that prey on fish, or the water snake which works along the low lands and feeds almost entirely on young fish. By gathering these eggs we save at least 90% of them.

It has been found from experience and careful watching that the catfish is a very destructive fish. I do not think that the brood fish eat their young, but after the young fish have hatched to a length of one to two inches they will eat the young of other fish of their same kind. At one time this fall there were placed in a tank with some adult catfish, one hundred fingerling yellow perch. These were allowed to remain in the tank over night and upon examination the next morning there were only six yellow perch remaining in the tank, the others being devoured by the catfish. On several occasions I have seen the brood fish in the ponds chase the small fish, but always appeared to be so clumsy that they were unable to catch them.

In the planting of the catfish, the Delaware River received a very liberal supply and the remaining fish were shipped out on applications which were filed at this station.

The Lake Erie bluegill sunfish spawned and hatched out very good, but owing to the cold spring were somewhat smaller than usual. The applications for this species were all filled and a large number planted by the Department. There still remains some to be shipped.

A large number of gold fish were hatched during the summer and supplied to the public schools and public places of Philadelphia.

The frogs that were hatched at this station were shipped to different parts of the State on application.

There has been a great change made on the river front along the hatchery grounds. The contract for the new sedimentation basin in connection with the filter plant of the city, was awarded and the work started early in the summer. This basin runs practically to the new hatching house, extending out in the river beyond low water mark. As there was seventeen feet of earth to be taken out of it, it was decided to throw up a bank in front of the hatchery grounds at low water mark. After this was finished the low marsh along the hatchery grounds was filled up, by means of a blowing machine, above high water mark. By doing this the hatchery gets about three additional acres of ground and carried the hatchery grounds out to the channel along the river front.

Through the interest taken by several of the councilmen of the City of Philadelphia, a bill was passed by Council appropriating \$5,000.00 for the building of a Rip Rap wall on the river front of this fill, a distance of four hundred feet more or less along the hatchery

front. The Department will now be in a position to construct some beautiful shad fry ponds along the river front on this plot of ground after it has been graded. It will be one of the beauty spots along the Delaware River between Trenton and Philadelphia.

The foundation walls for the extension of the hatchery building were completed before the fill was made. This extension is badly needed and it is advisable that this extension be made as soon as possible in order that more space for the fry tanks and aquariums which you propose to erect may be available.

The twenty foot gilling skiff was completed and turned over to the hatchery on April 9th and was very useful in the gathering of eggs and the planting of fish, as we were able to run into creeks and shallow water where it is impossible to go with the "Yacht Anna."

The boat which was captured by the State Police from illegal fishermen and turned over to me by them, was sent to the Wayne County Hatchery on directions from the office.

The slip running from the shore out to low water mark, a distance of four hundred and fifty feet, which had to be taken in during the winter months in order that it would not be swept away by the ice will not have to be put out in the future, as the fill in front of the hatchery does away with this.

It is very necessary that a sluice way be built at this hatchery extending from the upper end of the second largest pond nearest the river where the present sluice way ends, to the Delaware River. This sluice way should be separate from the ponds which would give us full control of the water in all of the ponds at all times. Under the present arrangement the water passes through the two lower ponds in order that it may enter the river, and usually once or twice during the spawning season of the catfish and sunfish we experience a heavy freshet which brings the stream up to such proportions that the water rushes through the lower ponds with such force that the little fish cannot hold themselves against the current, the result is that most of them are forced through the screens into the river and some of the larger ones are ground up at the screens by the force of the water.

The ponds at this hatchery are cleaned at least once a year and the fish all sorted. This work is generally done in the fall of the year when the fish can better stand the handling than at any other time of the year.

During the summer months the grounds were kept in good condition so far as possible.

On account of not having a proper place to shelter the "Yacht Anna" during the winter, it was stored at Delanco, N. J. The "Yacht Homer" is stored at the hatchery during the winter.

In closing my report I wish to thank you for the co-operation and the many courtesies extended to me in my work during the past year.

Following is the distribution of fish and eggs from the Torresdale Hatchery for the year ending November 30, 1915:

Adams County.	
Pike Perch Fry,	240,000
Yearling Sunfish,	4,600
Yearling Catfish,	1,600

Allegheny County.

Yearling Catfish,	200
Adult Catfish,	400

Bedford County.

Pike Perch Fry,	320,000
Adult Catfish,	300
Adult Sunfish,	300

Berks County.

Pike Perch Fry,	160,000
Yearling Sunfish,	7,400
Yearling Catfish,	1,300

Blair County.

Pike Perch Fry,	240,000
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Bucks County.

Pike Perch Fry,	400,000
Yearling Sunfish,	1,200
Adult Sunfish,	50
Yearling Catfish,	200
Yearling Yellow Perch,	200

Cambria County.

Yearling Catfish,	200
Yearling Sunfish,	400

Carbon County.

Yearling Catfish,	200
Yearling Sunfish,	2,600
Tadpoles,	2,000

Centre County.

Catfish, Adult,	100
Tadpoles,	3,000

Chester County.

Yearling Yellow Perch,	300
Pike Perch Fry,	160,000
Tadpoles,	3,000
River Minnows,	2,000
Yearling Catfish,	500
Adult Catfish,	200
Adult Sunfish,	200
Yearling Sunfish,	1,000

Columbia County.

Yearling Catfish,	100
Yearling Sunfish,	200

Cumberland County.

Pike Perch Fry,	80,000
Yearling Catfish,	200
Yearling Sunfish,	200

Dauphin County.

Yearling Yellow Perch,	100
Yearling Catfish,	200
Adult Catfish,	150
Yearling Sunfish,	1,500

Delaware County.

Yearling Goldfish,	100
Yearling Sunfish,	1,000
Yellow Perch Yearlings,	100
Yearling Catfish,	100
Tadpoles,	1,000

Elk County.

Tadpoles,	18,000
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Fayette County.

Yearling Catfish,	300
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Fulton County.

Pike Perch Fry,	1,200,000
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Huntingdon County.

Pike Perch Fry,	640,000
Yearling Sunfish,	600

Juniata County.

Pike Perch Fry,	80,000
Yearling Sunfish,	200

Lackawanna County.

Yearling Catfish,	2,100
Yearling Sunfish,	2,200

Lancaster County.

Yearling Yellow Perch,	100
Yearling Catfish,	1,100
Adult Catfish,	200
Yearling Sunfish,	1,800
Pike Perch Fry,	320,000

Lebanon County.

Yearling Catfish,	1,300
Yearling Sunfish,	800
Pike Perch Fry,	400,000

Luzerne County.

Yearling Sunfish,	1,000
Yearling Catfish,	200
Adult Catfish,	100

Lehigh County.

Yearling Catfish,	200
Yearling Sunfish,	3,000
Pike Perch Fry,	560,000

Mercer County.

Yearling Catfish,	100
Yearling Sunfish,	100

Monroe County.

Pike Perch Fry,	400,000
Yearling Catfish,	700
Adult Catfish,	150
Yearling Sunfish,	3,800

Montgomery County.

Tadpoles,	1,000
River Minnows,	1,000
Adult Catfish,	100
Yearling Catfish,	200
Yearling Yellow Perch,	365
Adult Sunfish,	25
Yearling Sunfish,	1,400

Northampton County.

Pike Perch Fry,	1,120,000
Yearling Catfish,	700
Yearling Sunfish,	1,800

Northumberland County.

Pike Perch Fry,	240,000
Yearling Sunfish,	400

Philadelphia County.

Yearling Yellow Perch,	204
Yearling Sunfish,	800
Yearling Catfish,	100
Yearling Goldfish,	525

Adult Catfish,	56
Adult Calico Bass,	2
River Minnows,	12
Terrapin,	2
Sunfish, Adults,	139

Pike County.

Yearling Catfish,	300
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Schuylkill County.

Yearling Sunfish,	200
Adult Catfish,	400
Yearling Catfish,	900
Pike Perch Fry,	80,000

Somerset County.

Yearling Catfish,	500
Yearling Sunfish,	200

Sullivan County.

Yearling Catfish,	1,200
Adult Catfish,	625

Susquehanna County.

Adult Catfish,	200
Yearling Catfish,	1,100

Wayne County.

Yearling Goldfish,	275
Yearling Catfish,	1,800

Wyoming County.

Yearling Catfish,	400
Yearling Sunfish,	1,000

York County.

Yearling Catfish,	500
Yearling Sunfish,	1,600

Planted by the Department of Fisheries in the Delaware, Susquehanna and Schuylkill rivers and tributaries:

Yellow Perch Fry,	50,000,000
Shad Fry,	3,640,000
Pike Perch Fry,	860,000
Adult Sunfish,	300
Yearling Catfish,	25,300
Yearling Sunfish,	15,000

Adult Goldfish,	6
Goldfish, Public Schools,	1,486
Terrapin, Erie Hatchery,	10
Frogs, Erie Hatchery,	3
Sturgeon, Erie Hatchery,	8
Eels, Erie Hatchery,	87
Adult Catfish, Erie Hatchery,	52

Recapitulation.

Shad Fry,	3,640,000
Yellow Perch Fry,	50,000,000
Pike Perch Fry,	7,500,000
Yearling Sunfish,	56,000
Yearling Catfish,	43,600
Adult Catfish,	3,283
Adult Sunfish,	839
Tadpoles,	28,000
Yearling Yellow Perch,	1,369
Yearling Goldfish,	2,386
Adult Goldfish,	6
River Minnows,	3,012
Terrapin,	12
Sturgeon,	8
Calico Bass,	2
Adult Frogs,	3
Eels,	87
Total,	61,278,607

Very respectfully,

J. R. BERKHOUS,
Superintendent.

REPORT OF ERIE AUXILIARY.

Union City, Pa., November 30, 1915.

Hon. N. R. Buller,

Commissioner of Fisheries,
Harrisburg, Pa.

Sir: Herewith is submitted my annual report covering the operations of the Erie Auxiliary, located at Union City, Pa., for the year ending November 30, 1915.

There are at the present time 21,440,000 white fish eggs in the hatchery and are an exceptionally fine lot of eggs. They were gath-

ered from the fishery of A. B. Hoover, at Nanticoke, Ont. The hatch from the eggs reported in the hatchery at the close of last year was a complete failure. These eggs were received from Put In Bay, Ohio, and were in very poor condition when received. The last shipment being in such poor condition that they were dumped into the sewer. When the cases were opened the odor which came from them was very bad. The dates on the tags showed that they were taken six to eight days previous to being received. The small amount that we saved were sent to Erie and planted in Lake Erie.

The lake herring eggs reported in the house at the beginning of the year were all planted in Lake Erie with the exception of about 400,000 eyed eggs which were sent to the Fairmount Park Aquarium, at Philadelphia to be used for exhibition purposes. At this writing the herring eggs for this year have not yet been received.

The pike perch eggs were received from the New York State Conservation Commission on the same basis as existed in previous years. There were received at this hatchery 9,000,000 pike perch eggs, the eggs being gathered at Constantia, N. Y. While this shipment is not as large as other shipments received, the eggs are of the finest quality, which shows that the fish are handled carefully from the time they are taken from the nets until the eggs are taken from them, and the fish liberated into the lake. The eggs after they reach the hatchery are constantly feathered at least one hour. They are then hardened and placed in hatching jars. They hatched from 90 to 95% which is a remarkable hatch for this species of fish. Weather conditions interfered to a great extent in the collection of these eggs. The nets are set around the mouth of the creek where the fishing is to be done in order to get the fish as they go up the creeks to spawn. Ice and wind very often drive them back just at the best spawning season, therefore, the supply taken is not as great as it might be under different conditions. The demand for pike perch fry during the past year was larger than the supply on hand. It is sometimes almost impossible to get all the applications filled which are on file, even should the supply of fish be large enough, as the weather conditions regulate the hatching. When the fish is developed in the egg ready to hatch, should a heavy thunder storm or warm rains come up the eggs would hatch all at the same time which means that the fry tanks would become overloaded and it would be impossible to hold them for any length of time. In this case the applicants have to be notified by telegraph or telephone and every train has to be used to ship the fish in order that they may reach the applicants in good condition. The fry should not be held in the tanks for more than four or five days, and as this is a very short period it does not give us time to fill all the applications. Such conditions existed this year. We were successful in getting the fry all out in fine condition and the applications which I was unable to fill with pike perch were filled with blue pike, the applicants in each case being notified of the change. In this way all applications were filled which were on file at the time of hatching.

A month after the pike perch work was done I drained the large pond off to make sure that all the fish had been taken out before putting in the small bass. This pond is located south of the hatching house, the water from the hatching house flowing into it. I was very

much surprised later on to find 20,000 pike perch in this pond, ranging in size from one to one and a half inches in length. I am at a loss to account for this strange occurrence. As the ponds at this station were all filled with small bass and being unable to hold these fish, 8,000 were sent to Mr. William Baird, at Cambridge Springs, for planting in French Creek and Drakes Mill Dam. The balance were planted by Messrs J. C. Caffish and George Treat at various points in French Creek. If it would have been possible part of these fish would have been sent to other points but as there was no place in which to hold them they were distributed as above stated. The size the fish attained in one month was equally surprising.

Most of the yellow perch eggs were received from the Wayne County Hatchery and were in the very best of condition and finest quality. The fry hatched from these eggs were all planted in Presque Isle Bay, at Erie. There were a number of adult perch which spawned and the fry from these eggs, as you directed, were planted in Sly Lake, Long Pond and Biglow Lake in Wayne county, and Stillwater Pond in Susquehanna county. The planting of these fish in the above mentioned ponds was for the purpose of infusing new blood into these bodies of water.

There were received at this hatchery 500,000 eyed muscullonge eggs from the Bemus Point Hatchery, located on Lake Chatauqua, N. Y. The eggs were of the finest quality and were received in the best of condition.

A number of interested and enthusiastic citizens here are interested in the stocking of Lake Canadohta and for the last three years have been stocking this lake and co-operating with the Department in making this body of water an egg producer. A number of fish have been caught above the legal size but have been returned to the lake as it is the intention of the sportsmen not to do any fishing at the present time.

The pike perch fry this year were planted in Conneaut, Edinboro, LeBoeuff, Sandy and Canadohta Lakes, French Creek, Venango and Allegheny Rivers and Presque Isle Bay.

As soon as the ice was gone the ponds were all drained and cleaned ready for the bass fry to be placed in them. The adult bass which were at the hatchery for breeding purposes were in a fine healthy condition. I had them in the large pond north of the ice house which at its greatest depth is eight feet. After the ice had left the ponds I examined the fish and they looked very healthy. About a week after this they did not seem to act naturally, as they would swim around as if crazy and would then make a dart along the bank of the pond, lie over on their sides and die. When this occurred they would not last more than five minutes. I lost 150 in this way. Upon examination they appeared to be very healthy but their liver was discolored and in a very unhealthy condition. What caused this I am unable to say. From what remained enough fry was produced to fill all ponds with the exception of one, and Mr. Holden, an employe at this hatchery, gave to the Department the fry from his bass which he keeps in a pond at his residence. This filled all the ponds on the place and all were doing fine and began to feed. I fully expected to get enough bass to fill the many applications which were on file at this station. On the 7th of July I noticed that the bass

stopped feeding and upon examination found that their jaws were swollen and a little sore spot appeared on the top of the head. Examining them more closely with a magnifying glass I discovered a very small parasite in their mouths and on their heads. I began using salt by scattering it over the ponds, sinking a bag of it at the inlet to dissolve. In a few days practically all the fish were gone. This condition existed in every pond. The fish that did survive were of no account. All in all the bass work during the past year was very disappointing, not only to myself, but to the many applicants who did not receive any bass.

In order that bass may be properly raised and good results obtained large areas of water containing natural food is necessary.

The stock of minnows in the streams the last two years has commenced to show results. I have been watching this very closely and as I had previously reported the food in the streams was practically gone; also the young bass which feed on the natural food. This year I have seen large numbers of one year old and two year old bass and plenty of minnows in the streams and I am of the firm opinion that this work should be carried on by the Department as extensively as possible, as it will be the means of saving thousands of young bass and increasing the supply in the streams.

The old hatching house which was in a very dilapidated condition was torn down and in place of this building four concrete ponds were built to be used for shipping ponds to hold the fish in the various stages of advancement when sorted for shipping. These ponds are fed from the Sheppard Pond. A well was drilled at the head of the supply pond, a six inch hole being drilled 146 feet deep. The drillers could not lower the water more than thirty-five feet by bailing it.

A storage house twenty-feet by sixty feet was built for the purpose of storing fish cans, nets, and other paraphernalia used about the hatchery. Put in a disposal plant at the dwelling house. Built a foundation under the kitchen, enlarged the cellar and put in tile to carry the water away from the house. A concrete walk was laid on the north side of the house and the south side of the barn. Cinders were placed upon the driveway and the dwelling was remodeled which was very much needed.

The following is the distribution of fish for the year:

Pike Perch, Fry.	
Blair county,	180,000
Butler county,	252,000
Clarion county,	300,000
Centre county,	240,000
Clinton county,	144,000
Crawford county,	924,000
Columbia county,	248,000
Dauphin county,	180,000
Erie county,	168,000
Forest county,	180,000
Huntingdon county,	288,000
Juniata county,	324,000

Luzerne county,	360,000
Lackawanna county,	828,000
Lycoming county,	1,164,000
Monroe county,	72,000
Mercer county,	48,000
Perry county,	72,000
Pike county,	108,000
Susquehanna county,	996,000
Snyder county,	180,000
Tioga county,	60,000
Union county,	144,000
Venango county,	420,000
Wyoming county,	588,000
Wayne county,	580,000
Warren county,	48,000
Total,	9,096,000

Pike Perch, Fingerlings.

Crawford county,	8,000
Erie county,	12,000
Total,	20,000

Blue Pike, Fry.

Berks county,	300,000
Bucks county,	400,000
Beaver county,	300,000
Bedford county,	200,000
Blair county,	300,000
Cambria county,	200,000
Dauphin county,	200,000
Indiana county,	200,000
Lancaster county,	200,000
Lackawanna county,	400,000
Lebanon county,	200,000
Lycoming county,	300,000
Montour county,	540,000
Mercer county,	300,000
Northumberland county,	460,000
Perry county,	400,000
Sullivan county,	700,000
Somerset county,	500,000
Susquehanna county,	400,000
Tioga county,	300,000
Wyoming county,	1,000,000
Wayne county,	520,000
York county,	200,000
Total,	8,520,000

Yellow Perch Fry.

Erie county, Presque Isle Bay,	15,400,000
Susquehanna county,	150,000
Wayne county,	450,000
Total,	16,000,000

Yellow Perch, Adults.

Armstrong county,	200
Allegheny county,	200
Adams county,	600
Blair county,	1,150
Clinton county,	750
Clarion county,	450
Clearfield county,	400
Crawford county,	950
Cambria county,	800
Forest county,	250
Indiana county,	200
Lycoming county,	850
Montgomery county,	150
Mercer county,	100
Tioga county,	600
Venango county,	325
Warren county,	100
Westmoreland county,	200
Total,	8,275

Muscallonge, Adults.

Crawford county,	25
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Muscallonge, Yearlings.

Crawford county,	50
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Muscallonge, Fry.

Crawford county,	155,800
Erie county,	204,000
Forest county,	26,000
Mercer county,	19,000
McKean county,	38,000
Venango county,	57,000
Total,	499,800

Blue Gill Sunfish, Yearlings.

Allegheny county,	300
Armstrong county,	1,500
Bradford county,	900
Clarion county,	2,050

Clinton county,	1,250
Indiana county,	1,600
Jefferson county,	2,400
Mercer county,	1,600
McKean county,	900
Northumberland county,	600
Sullivan county,	2,000
Somerset county,	1,450
Union county,	1,500
Venango county,	1,000
Total,	19,050

Blue Gill Sunfish, Adults.

Armstrong county,	200
Allegheny county,	200
Blair county,	125
Bradford county,	50
Clarion county,	45
Crawford county,	75
Erie county,	75
Lycoming county,	125
Mercer county,	60
Montgomery county,	200
Westmoreland county,	60
Philadelphia county,	15

Total,	1,230
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Tadpoles, Yearlings.

Adams county,	4,000
Bucks county,	4,500
Butler county,	2,000
Clearfield county,	7,500
Crawford county,	5,000
Clarion county,	225
Clinton county,	2,000
Elk county,	4,000
Jefferson county,	2,500
Luzerne county,	5,000
Lycoming county,	4,500
Montgomery county,	4,500
Mercer county,	1,000
Northumberland county,	2,500
Snyder county,	1,200
Schuylkill county,	10,000
Wyoming county,	5,000
York county,	12,500

Total,	77,925
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Small Mouth Bass, Yearlings.

Allegheny county,	450
Bradford county,	500
Monroe county,	600
Montgomery county,	1,000
Philadelphia county,	10
Pike county,	1,990
Snyder county,	600
Wayne county,	440
Total,	5,590

Large Mouth Bass, Yearlings.

Allegheny county,	250
Monroe county,	450
Northampton county,	850
Philadelphia county,	15
Total,	1,565

Crappie, Adults.

Erie county,	100
Mercer county,	12
Total,	112

Lake Erie Sunfish, Adults,

Allegheny county,	200
Butler county,	100
Clarion county,	10
Crawford county,	30
Erie county,	150
Mercer county,	185
Total,	675

Minnows, Yearlings.

Crawford county,	3,500
Erie county,	130,000
Total,	133,500

White Fish Eyed Eggs.

Erie Hatchery for Lake Erie,	2,520,000
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Lake Herring Eggs.

Erie Hatchery for Lake Erie,	25,250,000
Fairmount Park Aquarium, Phila.,	400,000
Total,	25,650,000

Summary.

Pike Perch Fry,	9,096,000
Pike Perch Fingerlings,	20,000
Blue Pike Fry,	8,520,000
Yellow Perch Fry,	16,000,000
Yellow Perch Adults,	8,275
Muscallonge, Adults,	25
Muscallonge, Yearlings,	50
Muscallonge, Fry,	499,800
Blue Gills, Yearlings,	19,050
Blue Gills, Adults,	1,230
Tadpoles,	77,925
Small Mouth Bass, Yearlings,	5,590
Large Mouth Bass, Yearlings,	1,565
Crappie, Adults,	112
Lake Erie Sunfish, Adults,	675
Minnows, Yearlings,	133,500
Total,	34,383,797

REPORT OF THE ERIE HATCHERY.

Erie, Pa., November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—I herewith submit my annual report covering operations of this hatchery from November 30th, 1914, to November 30, 1915.

The hatchery building was completed during the year and this station was able to get back to its former standard of output. Taking into consideration the drawbacks experienced due to the unfavorable weather conditions and other unforeseen conditions that are bound to appear in one period or another in fish cultural work, the record of this hatchery for the year just passed is one that I feel proud of.

The hatching of lake herring eggs taken last Fall was the most successful yet attained, there being a 75% hatch. The eyed herring eggs received from the Erie Auxiliary, at Union City, were hatched without any loss. The Department received from Canada 1,000,000 white fish eggs. Of this number more than 800,000 were cleaned up and hatched which is the usual percentage of hatch for this station. This is due to the fact that the Department's men handled the eggs from Canada entirely, and therefore, know that they are properly taken and cared for. There was a good take and hatch of blue pike eggs last Spring, which was the first in three years. No doubt this

station would have exceeded all previous records but for the fact that blue pike were a drug and the price was so low for the catching that the fishermen pulled out while the eggs were still on.

The yellow perch eggs which were received from the Wayne County Hatchery were exceptionally good. The loss before hatching being so trifling that it cannot be estimated or measured. The fry from these eggs were all planted in Presque Isle Bay. Numerous shipments of perch were also received from the Erie Auxiliary and were planted in the Bay.

On February 2nd there were sent from the Corry Hatchery 5,000 eyed lake trout eggs. These eggs were used to test the efficiency of filtered water in the hatchery. They began to hatch on February 4th, two days after received, and by March 1st were all hatched out. On the 3d of April the smell of Chlorine was quite noticeable from the water, and while this condition only lasted one day, on the 5th of April, two days later, over a hundred trout had died from after effects. From this time on they all did fine and commenced to feed on May 1st. On June 10th they had reached a size from two to three inches, at which time they were planted in the Lake owing to the temperature of the water becoming too high. The same experiment was made with lake herring eggs, with the exception that they were run on filtered water from the green stage just as soon as they came from the field in November. The eggs did not clean up as freely as the eggs in raw water, and while the loss was a little greater in the filtered water than the loss in the raw water, the fry were not as hearty and active, neither did they have the healthy appearance of the fry hatched in the raw water. This is proof that the filtering system is perfect, when you take into consideration that the fish were hatched from the green eggs. I believe the filtered water could be safely used throughout, but I intend making further tests this coming Winter.

A fair supply of blue-gill sunfish and other species for breeding purposes for the other hatcheries, was secured. The Department also received 100 pairs of adult small mouth bass through the courtesy of the Deputy Minister of Game and Fisheries, of Toronto, Ont. These bass were shipped to the Wayne County Hatchery.

The field work in general was successful in the taking of eggs, gathering fish and transferring fish from one body of water to another. Captain Mickelsen, of the Commodore Perry, with the assistance of a member of the crew were directed by the Department to go to Sharon to remove some fish. From August 17th to 19th the Captain and his assistant removed from 35,000 to 40,000 fish from the old canal to Buhl Lake. The fish transferred consisted of bass, perch, pike, suckers, sunfish and other varieties.

As is customary the Department had a live fish exhibit at the Conneaut Lake Fair from August 31st to September 3d, and from September 6th to September 10th the exhibit was held at Exposition Park during the convention of the Wild Life League of Pennsylvania. Both exhibits attracted much favorable comment and were admired by thousands of visitors.

The grounds around the hatchery building have been put in order; the lawns have been raised and surrounded by cement curbing on the west, and on the south side the lawn is backed with combination concrete walk and curbing. The grounds surrounding the Water

Works and Hatchery are spoken of in highest terms by visitors to the hatchery.

The contract for installation of aquariums on the 2d floor of the hatchery was awarded to the Henry Shenk Company in August. The work was to be completed by September 15th but the contractors were unable to live up to their agreement owing to their inability to secure the brass angles for the openings at the front of the aquariums and the securing of first class clear white cedar for the tanks. These conditions were hard to overcome and the contractors are not entirely to blame. I am glad to say, however, that the aquariums will be ready for operation early in the new year.

I am pleased to report that after a set-back of two years in the collection of white fish eggs from the Canadian Shore, through the courtesy of Hon. A. Sheriff, Deputy Minister of Game and Fisheries, of Toronto, Canada, the Department is taking a supply of eggs from one of the fisheries on the North Shore. This is an instance where true reciprocity is in operation, a policy of co-operation which is to be admired.

Owing to the continued warm weather during October and November the herring this Fall were ten days later than usual. Herring began to appear November 28th and spawn takers were sent out. The first herring eggs to appear out of Erie in the Fall are generally of the large Ciscoe or Jumbo herring as they are known here, and are caught to the westward of Erie. This year it was a failure and very few large fish were caught. Only 70,000,000 eggs of the large fish were taken. The smaller fish that are always caught to the east of Erie came in with a rush about the 6th of December, so that with the eggs taken from the small, or deep water herring, the total take amounted to 244,319,000, thus breaking the previous records of herring eggs taken.

After filling the batteries at the Erie Hatchery, eggs were shipped to the Erie Auxiliary, located at Union City, and the Torresdale Hatchery, located at Philadelphia. I also shipped some of the eggs to Constantia Hatchery in New York State. Notwithstanding that we met with many reverses we were still able to make a new record.

The appropriation of \$8,000 for the dredging of the channels and ponds in Presque Isle Peninsula was expended during the past Summer. The vast amount of work being done with the small appropriation available, amounted to 107,267 cubic yards of sand and gravel pumped to the shores surrounding the ponds, making it possible to walk around the ponds where previous to this work it was impossible to go around unless a person wore high boots. Two years ago the fish were unable to get into the ponds to spawn; today large schools of the various varieties are to be found. This is due entirely to the work of the Department in its efforts to restore to the fish their natural spawning grounds, reclaiming for natural conservation one of the finest bodies of water which benefits the whole people. Some dense underbrush was removed and walks made, affording easy passage around the ponds and to the Bay front. It is to be hoped that future appropriations will be such that the work can be carried out to completion.

I wish to call your attention to the fact that the City of Erie is very lax in caring for the State Canal Basins, particularly so the

West Canal Basin, wherein is located the boat house of the Commodore Perry, the Department's fishing tug. I have entered several complaints and in return have received many promises that the matter would be taken care of, but nothing ever materializes. Considerable trouble is being experienced and unless the Lighting Company, who operates near the West Canal Basin, and who are now depositing dirt and ashes in the basin, are compelled to take steps to prevent this refuse from getting into the Basin, the Basin will be entirely filled up and it will be impossible to get the Department's tug in and out of her mooring. This Basin was dredged out a few years back by the State Commission and the Department's boat was able to get to and from her mooring without any trouble. Today where this dredging was done cinders are to the surface of the water, entirely filling the channel. At the rate this is filling up it will only be a matter of a short time until the entire fishing fleet gathered in the canal basin will be driven out. Therefore, I would recommend that as speedily as possible some action be taken to care for this evil.

The Commodore Perry was put in dry dock last Spring for recalking and re-ironing of bottom. When the iron was removed a number of bad planks were found, also some bad frames, so that instead of the expenditure of a few hundred dollars as was expected, the Department was forced to spend more than \$600.00. This expenditure, together with the regular operating expenses of the Commodore Perry, will, before the end of two years make it necessary to lay up the tug, owing to lack of funds.

Carp fishing was carried on in the Bay under special licenses as in the past. Reports will probably show a catch equal to that of 1914.

Respectfully,

P. H. HARTMAN.

Lake Herring Eggs.

Erie Hatchery,	176,952,000
Torresdale Hatchery,	28,280,000
Union City Hatchery,	19,392,000
Constantia, New York, Hatchery,	19,695,000
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	244,319,000

White Fish Eggs from Canada.

Erie Hatchery,	22,590,000
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Blue Pike Eggs.

Union City Hatchery,	176,952,000
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Large Mouth Bass, Fingerlings.

Erie county,	400
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Small Mouth Bass, Fingerlings.

Erie county,	69
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Small Mouth Bass, Adults.

Erie county,	51
Wayne county,	205
Philadelphia,	25
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Total,	281

Yellow Perch, Adults.

Erie county,	1,171
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Yellow Perch, Fingerlings.

Erie county,	6,200
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Yellow Perch, Yearlings.

Jefferson county,	250
Cambria county,	400
Beaver county,	200
Fayette county,	25
Crawford county,	2,500
Mercer county,	600
Butler county,	600
Lawrence county,	400
Allegheny county,	300
Philadelphia county,	25
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Total,	5,300

Blue Pike, Yearling.

Erie county,	19
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Blue Pike, Fry.

Lawrence county,	200,000
Mercer,	300,000
Erie county, Lake Erie,	55,486,000
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Total,	55,986,000

Muscallonge.

Erie county, Adults,	8
Erie county, Yearlings,	19
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Total,	27

Blue Gills, Adults.

Erie county,	987
Crawford county,	2,600
Butler county,	100
Philadelphia county,	25
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Total,	3,712

Rock Bass, Adults.	
Butler county,	100
Philadelphia county,	25
Erie county,	8
Total,	133
Calico Bass, Adults.	
Erie county,	163
Red Breasted Sunfish, Adults.	
Erie county,	900
Elk county,	200
Cambria county,	200
Beaver county,	140
Total,	1,440
White Bass, Adults.	
Erie county,	30
Sheeps Head, Adults.	
Erie county,	2
Gar Pike, Adults.	
Erie county,	2
Yellow Catfish, Adults.	
Erie county,	6
Channel Catfish, Adults.	
Erie county,	3
Lake Minnows.	
Erie county,	210,000
Lake Trout, Fingerlings.	
Erie county,	5,000
White Fish, Fry.	
Erie county, Lake Erie,	3,326,400
Lake Herring, Fry.	
Erie County, Lake Erie,	126,747,500
Yellow Perch, Fry.	
Erie county, Presque Isle Bay,	50,000,000

Eggs from Field Work, Lake Erie, 1915.

Blue Pike Eggs,	93,310,000
White Fish Eggs,	22,590,000
Herring Eggs,	244,319,000
Total,	360,219,000

The following is a list of licenses, kind of and amount of same issued during the year:

Pound Nets, 60 at \$10.00.....	\$600 00
Trap Nets, 148 at 5.00.....	740 00
Steam Tugs, 61 at 20.00.....	1,220 00
Steam Tugs, 11 at 15.00.....	165 00
Gas Tugs, 8 at 10.00.....	80 00
Gas Tugs, 12 at 5.00.....	60 00
Row Boats, 6 at 5.00.....	30 00
Night Lines, 25 at 1.00.....	25 00
Total,	\$2,920 00

THE FISH WARDEN.

The Fish Warden who tries to do his duty and perform his obligation to the State is probably the man whose experience is the most varied of all humanity. Did you, who enjoy a day of sport with the rod and line, stop to consider the difficulties experienced by the officer who is trying to do his duty and protect the source of your pleasure? Did you ever realize the ungrateful exhibition, even by sportsmen, if the warden happens to come along while they are fishing? How many of you say, Mr. Warden, I am glad to see you. I am glad you are honestly trying to do your duty, for you are my servant; much of our future recreation depends upon your faithfulness. Your hours on duty are twenty-four each day. You are expected to stop all illegal fishing no matter at what hour of the day or night that the illegal fisherman may choose to fish. If you need me I shall gladly assist you. Can I not accompany you some lonely night when you have an ugly trip to make; or to get a certain gang of illegal fishermen who have armed pickets out to watch that you don't surprise the gang and catch them before they escape? I fear you say nothing of the kind, but the warden goes quietly to the place violations are reported to take place in the night time, for that is the time the laws are generally violated. He is unaccompanied.

He takes a position near the suspected place. Not a sound is heard, save the barking of a dog in the distance. Yes, sometimes the

shadows of night are so soft and noiseless that the beating of your own heart is the only sound you hear.

After remaining in this position for perhaps several hours you hear a shuffle, a snapping of twigs. Presently low voices; then moving objects and the next moment a half dozen men are engaged in illegal fishing almost within your reach. You are entirely alone with the pirates of the night.

What would you do? What will the pirates of the night do when they learn of your presence; Would you approach them; These are only few of the conditions that the average warden is required to meet.

ARRESTS.

During the year the wardens of the Department and members of the State Police force made 337 arrests for violations of the fish laws. The fines imposed for these offences amounted to \$6,765.30. The Department, owing to the small force of wardens it has at its command, was compelled to call upon the State Police for assistance and in no instance did the State Police fail in their work while they were working under instructions from this Department. As they were detailed on some of the worst cases it speaks very highly for their efficiency.

Carp nets in Presque Isle,	24
Dynamiting fish,	24
Fishing with seine nets illegally,	30
Illegal dip nets,	15
Illegal fyke nets,	5
Fishing with nets in trout streams,	8
Spearing in trout streams,	9
Taking short trout,	10
Taking short bass,	8
Taking short pickerel,	3
Taking bass out of season,	8
Taking game fish out of season,	12
Fishing with lay-out lines,	30
Gigging,	5
Fishing on Sunday,	16
Illegal fish baskets,	7
Pollution of streams,	9
Using illegal devices not specified,	6
Fishing within 400 feet of dam,	9
Excessive hand lines,	2
Net with wing walls,	7
Looping,	16

Obstructing migration of fish,	2
Resisting arrest,	1
Taking trout from private hatchery illegally,	19
Gill netting,	3
Drawing off dam illegally,	6
Scoop net,	3
Illegal tip-ups,	8
Unnaturalized foreign born residents,	32
Total,	337

WARDENS' REPORTS.

The following are the reports of the various wardens of their work during the year:

REPORT OF WARDEN J. P. ALBERT.

Harrisburg, Pa., November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Dear Sir: I have the honor to herewith submit my annual report for the year ending November 30, 1915.

My work during the year just passed was entirely on water pollution. By special appointment I had many conferences with owners of mines, tanneries, paper mills, chemical mills, gun cotton plants, glycerine works, and tanneries. In my work on stream pollution I visited and inspected during the year 229 manufacturing plants, including tanneries, mines, chemical mills, etc. The meetings which I had with the different manufacturers and mine owners were very favorable and were held for the purpose of explaining to the manufacturer the workings of the Department's system of filtration, which is being recommended by the Department for the purpose of neutralizing and clarifying the refuse which comes from their plants and which flows into the streams, thereby killing many fish and destroying the garden of the fish. The manufacturers with whom I had meetings were all anxious to receive the prints of the apparatus in order that they might go over them carefully and install the system. They all very readily agreed to comply with the wishes of the Department, as they readily saw the good points and the practicability of the system recommended. The water coming from the coal mines

located in the western part of the State is very deleterious and destructive to fish life. Where this refuse is allowed to run into the stream, it kills everything it comes in contact with, thereby making the streams void of any fish life. The Maple Grove Coal Mining Company, located at Raymilton, Pa., installed the filter recommended by the Department and the filter since its installation over a year ago is taking care of the mine water and is coming up to the expectations of the Department. Prior to the installation of this filter, every year for the past eight years, complaints frequently reached me that the fish were being killed by the water coming from this mine, and upon investigation found that the complaints were well founded. Since this filter was installed the fish are abundant in the stream and no more complaints are received. Thousands of fish were slaughtered each year by this mine water and for many miles down the stream the same condition existed. All kinds of fish were destroyed. About a year ago I received instructions from the Department to visit this mine as it was understood that the Company was about to turn their mine water into the stream. I proceeded as directed; got into communication with the mine owners and advised them not to allow the mine water to get into the stream, also advised them that I would call and see them at once, which I did. I recommended the filter to the owners and they very readily agreed to install it. After it was installed the company released the mine water which had been stored up for about a year and drained it through this filter in less than three weeks. There were 17,500,000 gallons of mine water run through this filter, draining from fifteen to twenty acres. There was not one fish killed by this water after it passed through the filter and run into the stream. The filter was not as large as the Department wished it to be, nevertheless the mine water was neutralized to such an extent that no fish were killed, and shortly afterwards vegetation began to grow and the fish are thriving in the stream. After the plants which are located on the tributaries of this stream have installed this system of filtration there will be no further complaints received from this locality. The cost of this filter was approximately \$62.50. The Department thinks that this test was as severe as could be given to any apparatus and is very gratified with the results.

Referring to the neutralizing and clarifying of the refuse which comes from other plants, such as tanneries, refineries, gun cotton works, glycerine works, etc., I found that this system of filtration meets the necessary requirements, and if it is properly installed and kept in good working order it will not fail to keep the streams free of deleterious and poisonous matter. After this filtration system is installed it requires very little labor to keep it in good working order, as it works by gravitation and, therefore, takes care of itself. The Department's system is not only a neutralizer and clarifier, but also a money maker to the manufacturer or mine owner who installs it. With this system installed the refineries are able to reclaim all waste oil which formerly escaped from the plants and goes into the stream. The tanneries reclaim hair, fleshings and lime. Oil operators reclaim all their waste oil, and in case of accident to their plants where oil is liable to escape, this system will take care of it and there will be no loss to the operator. In fact where by-products are of any value to the manufacturer, this system of filtration will save it for him.

Owing to the continued and excessive rainfall during the past year the streams were continually overflowing and not as many fish were caught as in former years, but this had a tendency to protect the fish and the coming season should prove to be a good one. I found in the performance of my duties that the streams were void of minnow life, the food which is necessary for the bass and other fish. This seems to be a common complaint of the fishermen and I believe that in order to have good fishing it will be necessary to restock the streams with fish foods, such as minnows and frogs.

The latter part of August I was ordered to leave my district in the northwestern part of the State and move to Harrisburg, Pa. I arrived in Harrisburg on the 8th day of September and since that time have been located there. My work since moving to Harrisburg necessitated my working in the office sending out prints of the filter and occasionally making inspections of plants nearby.

Very respectfully,

J. P. ALBERT.

REPORT OF WILLIAM J. ACKER.

Allentown, Pa., November 30, 1915.

Hon. Nathan R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir: I have the honor to herewith submit the report of my work as State Fish Warden for the year ending November 30, 1915.

The year just ended has been a very busy one for me as I have been assigned to work in practically every county in the Commonwealth, necessitating much travel and expense, owing to the small number of wardens which the Department has under its control.

My work during the year has been devoted almost entirely to pollution of the streams. In order that the restocking of the streams with fish may be beneficial, it is absolutely necessary that refuse which is deleterious to fish life be kept out of the streams. In my travels over the State on this work I have found that the majority of manufacturers are willing and anxious to co-operate with the Department in its endeavor to clarify the streams and restore them to their former state of purity. The manufacturers have found out that it is not the intention of the Department of Fisheries to harass them or compel them to unnecessarily expend money, but rather to assist them in their work, and this is forcibly brought to notice from the fact that the Department has adopted a system of filtration which has been worked out by a member of the warden force and the Commissioner of Fisheries, which will, when properly installed, and

properly taken care of, take care of the refuse from all manufacturing establishments. This is a great help to the wardens in their work as in the past they had no system which could be recommended. All that the warden could say to the manufacturer was "Section 16 of the Act of May 1, 1909, provides that no deleterious matter is to be run into the stream," but no device could be recommended. With the present system of filtration which has been adopted by the Department, the warden can go to the manufacturer, show him the prints of the system, which he always carries with him, and tell him that it must be installed.

The fish of the State are the property of the Commonwealth and are for use and benefit of the whole people, not only as a very important food supply, but as a means of sport and recreation.

The laws protecting fish from wasteful methods of fishing are not new, as we find them to have been enacted in England as far back as the twelfth century. Having taught the people the importance of the laws protecting the fish so that they will propagate and multiply, it will be an easy matter to create and arouse public sentiment of the absolute importance of keeping the waters of the Commonwealth pure and undefiled so that the fish may live and thrive therein. Pollution is simply waste and all waste is contrary to economic laws. When a stream is polluted so that fish will not live in it and cattle will not live on it, and the dweller on the stream cannot use it for household purposes, certainly his property rights are invaded, and when in addition pollution threatens his health his life is in danger.

Every year public sentiment is growing stronger in demanding the clarification of the streams and it is a great pleasure to feel that the courts are swinging around in accord with public sentiment and upholding the Department in its work. In my estimation the end of pollution seems in sight. This will be brought about by the installation of the patented system of filtration which, as I stated before, has been adopted by the Department for the purification of the refuse from coal mines, tanneries, chemical works, paper mills, acid factories, oil wells, and all forms of industries that are now polluting our streams. In view of the fact that this filter can be installed at a moderate cost and the water made pure, it seems to me that there can be no further excuse for the continuation of the pollution of the streams. The work done during the past year indicates that with sufficient appropriation, allowing the employment of the full number of wardens allowed by law, it will not be many years before a large majority of the streams in the Commonwealth are restored to their former state of purity and that there will be fishing for everybody.

The present method of planting fish one year old, ranging in size from four to seven inches, seems to give universal satisfaction, and the majority of fishermen with whom I have talked in my travels over the State, think it will bring far better results than the planting of the fingerling fish.

Owing to the excessive rain fall during the past year fishing was not as good as it would have been had there not been so much rain, but with all the rain, fishing was better this year than it has been in a number of years which shows that the planting of fish one year old is bringing the desired results.

The number of arrests made by me during the year number one hundred and eleven (111), as follows:

Bass out of season, two.
Short bass, two.
Fish baskets, two.
Obstructing the migration of fish, two.
Illegal dip nets, thirteen.
Looping, thirteen.
Gill netting, two.
Illegal fyke netting, four.
Seining, twenty-five.
Dynamiting, five.
Pollution, two.
Illegal drawing off of dam, six.
Hooking, two.
Scoop net, two.
Illegal spearing or gigging, six.
Taking trout from private hatchery illegally, nineteen.
Seining within four hundred feet of dam, four.

Out of the 111 arrests, 101 were convicted, 79 of the defendants were sent to jail in default of payment of fines, eight were not tried and two cases withdrawn. The total amount of fines paid amounted to \$945.00.

Under the provisions of Section 22 of the Act of May 1, 1909, I arrested and convicted nine defendants. The Justice of the Peace who heard these cases decided that he could fine the defendants from one to fifty dollars, using his own judgment in the matter. The result was that the defendants were fined \$25.00 each notwithstanding that the section provides for a fine of \$50.00. After this matter was taken up by the Department with the Attorney General's Department the balance due the Commonwealth is being collected by the Attorney General's Department. Adding this \$225.00 to the amount of fines collected makes a total of fines equal to \$1,170.00.

During the year the wardens were called together on several occasions and the work taken up with them by the Commissioner. These meetings are of much benefit to the wardens as they bring them in closer touch with each other and tend to create a closer co-operation in their work.

During the week of November 15th, I attended the Third Pennsylvania Welfare and Efficiency and Engineering Conference which was very instructive. This meeting brought to the attention of the wardens the workings of the various State Departments.

I herewith give a detailed account of my work for the year:

On December 1st and 2d I took up the pollution of streams by manufacturers in the vicinity of Allentown, making a complete report of the same to the Department. December 3d had a hearing at Chambersburg for the illegal use of fish basket and obstructing the migration of fish. While in this vicinity I inspected the Conococheague Creek. Took samples of tannery refuse and returned to Allentown after my work was completed on the 6th. On the 15th investigated a complaint made by the Easton Fish & Game Association of illegal fishing in the Delaware River. The following day I

was sent to Stroudsburg, taking up the pollution of the streams in that vicinity and also taking samples. December 17th, 18th and 19th patrolled the Jordan Creek and Little Lehigh River. On December 21st went to Stroudsburg to prepare the cases for the hearings. December 22d to 31st patrolled streams in Lehigh County, taking up illegal fishing and the pollution of streams.

From January 1st to 15th patrolled streams in Lehigh, Berks, and Northampton Counties, making several arrests for the violation of the fish laws. January 15th was at Stroudsburg meeting Attorneys Shull & Shull who were interested in the pollution of streams by certain manufacturers. January 16th to 31st patrolled streams, made out informations &c., for cases in Lehigh, Berks and Lancaster Counties.

From January 1st to 14th watching for illegal dip netting in the Little Lehigh and Jordan Creek and patrolled streams in the vicinity of Bethlehem, watching day and night for a gang of illegal fyke netters. On the 15th of February I went to Lambertsville, N. J. to meet the New Jersey Wardens relative to the seining in the Delaware River; spent two days and nights with these wardens. February 18th to 23d patrolled streams in Lehigh, Berks and Northampton Counties. Was called to the office at Harrisburg on the 24th and directed to go to Lycoming and Tioga Counties and take up some pollution work in these counties. I visited tanneries in Elkland and Westfield and paper mills in the vicinity of Williamsport. On the 26th I investigated pollution from Westfield to Harrison Valley, going to Galeton, Potter County, in the evening. On the 27th and 28th visited chemical mills on Lyman Run and Pine Creek.

March 1st, together with a constable from Galeton went into Black Forest, Potter County, arresting three dynamiters. March 2d investigated pollution by chemical mills from Galeton to Walton and various other points in Cameron County. From the 3d to 6th patrolled streams from Emporium to Williamsport, taking in powder mills, tanneries, &c., located on Sinnemahoning Creek, Young Woman's Creek and Lycoming Creek and various other streams in that vicinity. On the 7th returned to Allentown and the balance of the month I spent in patrolling streams in Lehigh and Northampton counties.

April 1st to 12th patrolled streams in Lehigh County investigating several complaints of illegal fishing and taking up the pollution of Cedar Creek by dye works. On the 12th of April was called to Harrisburg to attend a meeting of the wardens with the Commissioner. April 14th went to Saylorsburg, Monroe County, arranging a pollution case, returning to Allentown in the evening. From the 15th to 30th patrolled streams in Lehigh County and prepared information for several pollution cases; also for illegal fishing.

May 1st to 14th was spent in the vicinity of Allentown working up cases of pollution and illegal fishing. Went to Reading on the 14th supervising the work of transferring fish and drawing off of Hyde Park Dam. Returned to Allentown and then went to Stroudsburg and Bangor, taking up pollution cases, also a dynamite case. 24th to 31st worked in Montgomery County, having hearings for illegal fishing.

During the month of June patrolled streams in Monroe, Carbon, Lehigh and Northampton Counties, taking up pollution and illegal fishing cases.

July 1st went to Kutztown holding a hearing on a fyke net case; returning to Allentown in the evening. Received a complaint that there was some looping in the vicinity of Alburtus, watched the creek at this point and returned home. On July 3d I arrested three for seining in a trout stream, also had a hearing of defendants for looping in April at eight P. M. and at eight thirty P. M. held a hearing of two defendants who were arrested for gigging on June 30. On July 4th I went to Wind Gap and McMichaels, Monroe County, relative to drawing off dam and taking and seining trout. In the evening I investigated a case at Saylorsburg relative to calico bass. On the 7th I had a hearing in one of the seining cases. On the 8th and 9th I worked on pollution cases on Broadheads Creek. July 12th took up the pollution work in the vicinity of Allentown. On the 14th was called to Harrisburg, and on July 15th went to Bethlehem with the Commissioner; from there to Stroudsburg with attorneys relative to the seining at McMichaels, returning to Allentown on the 16th. Investigated a complaint of pollution on the 17th and 18th at Catasauqua. July 19th made out information against eight defendants at Stroudsburg. 20th to 30th together with the State Police investigated seining cases on McMichaels, the investigation taking me to Stroudsburg, Bear Creek, Wilkes-Barre, Tannersville, Pocono Lake, Wind Gap and McMichaels.

During the month of August took up cases of pollution and seining in Monroe, Carbon, Lehigh and Northampton Counties. On the 14th was called to Pleasant Mount to attend a meeting of the wardens at the Wayne County Fish Hatchery.

September 1st I went to Saylorsburg and Stroudsburg to attend a hearing of pollution cases. 2d and 3d secured information and witnesses in the seining cases at McMichaels. September 4th investigated pollution cases in Northampton County. On the 5th and 6th I was in Carbon and Monroe Counties and on the 7th sent to Scranton and from there to Glen Eyre, Pike County, relative to the Blooming Grove Hunting & Fishing Club. 8th to 12th worked on the seining cases in Pike County. The balance of the month was spent patrolling streams and investigating complaints in Pike, Monroe, Wayne, Luzerne, Lackawanna, Carbon, Northampton and Lehigh Counties.

October 1st arrested two illegal fishermen at Pocono Lake. October 3d to 6th held hearings in Pike and Luzerne Counties. On the 7th I went to Promised Land, Cresco and Canadensis, also to Wilkes-Barre and Scranton in the evening. On the 9th I inspected a series of dams installed at Saylorsburg for the purpose of taking care of pollution. On the 11th had a hearing which was continued from September 1st. 12th to 14th was spent in Monroe, Carbon and Pike Counties. On the 17th I supervised the transferring of fish from a dam at Cedarville. On the 18th held hearings at Mauch Chunk, the cases being continued until October 25th. On the 20th and 21st I was busy subpoenaing witnesses for the cases at Mauch Chunk. On the 25th held a hearing at Mauch Chunk of the cases which were continued from the 18th. October 26th was directed to go to Pottsville with reference to the seining and drawing off of a dam. Spent two days investigating this complaint, and on the 28th made out informations against the violators.

November 1st to 4th were spent patrolling streams in Lehigh County. On the 5th of November held hearings of the seining cases

at Pottsville. On the 6th and 7th spent my time in patrolling streams in Schuylkill and Berks Counties. From the 8th to 14th I was confined to my bed with illness. During the week of November 15th was at Harrisburg attending the Third Pennsylvania Welfare and Efficiency and Engineering Conference, also a meeting of the wardens during this week. The balance of the month was spent in patrolling streams in Lehigh, Berks and Northampton Counties.

Very respectfully,

WILLIAM J. ACKER.

REPORT OF C. R. HOLLAND.

Beach Haven, Pa., November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—I have the honor to herewith submit my report as fish warden for the year ending November 30, 1915.

During the months of January and February I patrolled the streams in my district, and while I investigated many complaints of illegal fishing with tip-ups in trout streams, I found that most of the cases were out-lawed. Some of the informers when questioned by me denied having written to me, still I made four arrests and secured three convictions for using tip-ups in trout streams.

I visited the Tannery of J. Pasens & Son, located at Middleburg, and took the installation of a filter up with the superintendent of the tannery, and after going over the matter with him he promised to install a filter. On the 17th of February I returned to the tannery and found that nothing had been done to prevent the tannery waste from getting into the stream. I gave them until the 17th day of March to make this installation and to have the filter in operation. Upon returning on the date set I found the filter working satisfactorily. I visited the tannery on September 14th and found Middle Creek on which the tannery is located, very clear, and on investigating the filter found that it was doing the work.

During the month of November on directions from the Commissioner, I went to the tannery again as a complaint had been made by someone. Hired a team at Middleburg and drove three miles down stream to Miser's Station, crossing Middle Creek at Globe Mills and going up along Middle Creek to the tannery. The stream was in good condition and the cattle drinking the water from it. I interviewed the superintendent and he advised that the filter was being looked after and was doing the work satisfactorily but was very

costly. On November 23 I visited the Millville tannery and the superintendent promised to have a new filter installed, as the old one was too small to properly take care of the refuse coming from the plant, as the tannery had been enlarged since the first filter had been installed. Visited the tannery at Jamison City and found the filter not working owing to the fact that it had not been cleaned for six months. The superintendent was at once ordered to clean the filter and reload it, which he agreed to do.

During the week of November 15th I attended the Third Pennsylvania Welfare, Efficiency and Engineering Conference, which was held in the Capitol at Harrisburg. During the week the wardens were called together by the Commissioner and the work gone over with them. This Conference proved to be very beneficial to all, as it brought the employes of the several Departments in closer contact with each other, giving to them a better idea of the work done by the several Departments.

At Danville the Lackawanna Railroad Company was building a sewer to drain the water from the old Pennsylvania Canal into the Susquehanna river, and on November 1st I went to Danville, hired the necessary help to transfer the thousands of fish to the river and was successful in transferring thousands of fish to the Susquehanna river. The fish were put into cans loaned by the Danville Board of Health who together with the Police Department gave me every assistance possible in doing this work.

Visited the Extract plant and tannery at Mount Union and directed the superintendent to install a filter to take care of the refuse coming from the plants. The superintendents very readily agreed to have the filters installed.

As customary I was detailed for work at McCall's Ferry Dam during the shad season. I was assisted in my work by Mr. Flaharty, who had assisted me in previous years. On account of the very cold water and adverse weather conditions in general no shad were caught until the 14th of April. On this date there were two caught at Whistler's Dam and one at the Face Rock. On the 16th four more were caught at the Narrows and from then on the catch increased slightly. On the 19th of April the water became so low that the shad could not come up to the dam. From April 23d to May 1st the weather was very cold and the water low and no shad were caught during this time. From the 1st to the 6th day of May shad were quite plentiful and sold at wholesale from seventy-five to eighty-five dollars per hundred.

On the 5th day of May I visited a sawmill owned by Mr. Shank at Peach Bottom, and upon investigation found that sawdust from his mill was running into Peter's Creek. Brought prosecution against him and was convicted before a justice of the peace and fined \$100.00.

About the middle of May I examined the fishway as the water was very low and found some salmon, bass, and suckers in the lower pool.

Taking all into consideration the shad season was one of the poorest experienced by the fishermen and this condition seemed to prevail everywhere.

Received a check for \$3.40 as witness fees in the case of Commonwealth vs. Shank, and as the wardens receive no compensation other than the salary which they are paid I turned the check over to the Department which was afterwards remitted to the State Treasurer.

Few of the fishermen below the Pennsylvania line attempted to come into Pennsylvania waters to fish, as was the case in previous years, therefore, there was no gill netting attempted. The salmon fishing was never better at this point.

From observations I made while performing my duties the fishing conditions during the season just past were very poor. This was due to the excessive rainfall, as the streams were at all times too high for fishing, nevertheless the streams abounded in fish life and the coming season, if weather conditions are suitable, should be better than in many years past. I found that people who some years ago were always ready to violate the fish laws, and at times take a shot at the wardens, were living up to the law, and in many instances giving valuable information to the wardens in making arrests.

During the year I made five arrests and secured four convictions; the fines amounting to \$160.00.

Respectfully,

C. R. HOLLAND.

REPORT OF WARDEN FRANK F. SAYLOR.

Ironbridge, Pa., November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—I have the honor to respectfully submit the following report of my duties as State fish warden for the year ending November 30, 1915:

During the month of December, 1914, I patrolled a number of streams in Berks, Chester and Montgomery Counties. I spent a number of days supervising the drawing off of the water from the Schuylkill Canal from Birdsboro to Parkersford. Many fish were saved from destruction and violations of the fish law prevented.

During the month of January I patrolled a number of streams in Berks, Chester and Montgomery Counties, the Perkiomen Creek and Schuylkill river overflowing their banks twice in about one week, leaving many of the fish stranded on the lowlands. With the assistance of the citizens living along the streams the fish were returned to the water. During the past season the streams in this vicinity have been exceedingly high, due to the excessive rainfall which had a tendency to protect the fish.

A complaint was made to the Department that an Electric Company in the vicinity of Philadelphia did not have the intake from the canal properly protected. I was directed to investigate this matter, which I did, and made a full report with a draft to the Department.

During the month of February I patrolled the following streams: Perkiomen creek, Schuylkill river, Delaware river at Trenton Falls,

Skipack creek and Chester creek in Delaware county. On the 8th day of February, on instructions from the Department, I went to Morrisville to investigate a complaint on the Delaware river below Trenton Falls. After investigating the matter very fully found the complaint without foundation. The river at this point is very beautiful, and from what I could learn from the natives along the river, there are many violations during the shad season and in the late fall. The work is very hard at this point as the people as a rule seem to have little use for a fish warden and from what I could learn some of the constables along the Delaware river are in line with the fishermen so it is a hard matter for one warden to get the pirates while working alone.

On February 11th I went to Lenni to investigate a complaint that trout had been caught illegally by some unknown person. On account of the polluted condition of Chester creek at this point I believe it is hardly possible for a typhoid germ to live in it, much less a trout.

On February 19th I was taken ill and was confined to my bed for about two weeks.

During the month of March I patrolled the following streams in Berks and Montgomery counties: Schuylkill river, Manatawny creek, Skipack creek, the West Branch of Swamp creek and the Perkiomen creek.

On March 27th I arrested three men for using dip nets in a trout stream. The defendants were brought before the justice and when I produced my witnesses who made the complaint they swore that they never saw the defendants fish and for this reason the case was lost and the defendants discharged.

In April the following streams were patrolled in Berks, Chester and Montgomery counties: Manatawny creek, Schuylkill river, Valley creek, a trout stream, Skipack and Perkiomen creeks. While patrolling Valley creek I found a fyke net. After having watched it for a few days and not being able to locate the owner the net was destroyed.

During the month of May I patrolled streams in Chester, Delaware and Montgomery counties as follows: Schuylkill river, Valley creek, a trout stream, Mansell's run, Chester creek, Ridley creek, Crum creek, Darby creek, the Perkiomen and Skipack creeks.

During the month I made five arrests securing four convictions. All the defendants went to jail as they were foreign born residents and had no money. After serving a few days in jail two of the defendants paid their fine and were discharged.

On June 2d I was directed to go to Quakertown to investigate a complaint of violations on Tohickon creek between Quakertown and Randt's Mill. During the month the following streams were patrolled: Tohickon, Schuylkill river, Skipack and Perkiomen creeks. Made one arrest, the defendant having violated the act prohibiting unnaturalized foreign born residents from fishing in the waters within this Commonwealth. The defendant was found guilty and paid his fine.

The bass fishing in the Perkiomen creek during the past season was very good, the anglers being well paid for their labors by getting a good string of bass.

During the month of July the following streams were patrolled in Berks, Chester and Montgomery counties: Schuylkill canal, from Birdsboro to Douglassville; Schuylkill river, from Birdsboro to Norristown; Monocacy creek, Manatawny creek, Skippack creek, Valley and Perkiomen creeks. Owing to the heavy rains during the month of July there was no bass fishing of any account. I was directed to go to Birdsboro on July 13th to investigate a complaint about some dynamiting. On investigation I found that the Monocacy creek had been dynamited during the summer, and was informed that this also occurred on Saturday night. After spending about a week in the vicinity of Birdsboro I arrested five men for violating the fish law. These men were found guilty.

During the month of August the following streams were patrolled: Perkiomen creek, Schuylkill river, East Branch and Neshaminy creeks. On August 2d I attended the hearing of the five men who were arrested on July 18th for illegal fishing in Monocacy creek near Birdsboro. Three of the defendants paid their fines and costs, the other two taking out a writ of certiorari. At this writing the cases are still pending.

On the fourth of August, owing to the extensive rainfalls the streams in this vicinity overflowed their banks, causing much work in returning the fish which were left stranded high and dry back to the waters. The sportsmen all along the line assisted in placing these fish back in the streams so that a number of fish were saved that would otherwise have been lost. Special Wardens A. P. Pfleger and John Gouldy gave me much assistance in this work.

Pursuant to a call by the Commissioner I went to the Wayne County Fish Hatchery on August 14th to attend a meeting of the wardens. This meeting brought us in closer contact with each other, which I consider was a great benefit. A new system of filtration which has been adopted by the Department was explained to the wardens, and in my opinion, this system in time will be the means of clarifying the streams in this Commonwealth.

On August 16th I investigated a complaint of illegal dip netting at Conshohocken. Made one arrest and destroyed one dip net. On August 26th I arrested three unnaturalized foreign born residents at Bridgeport for fishing which is contrary to the Act of April 21, 1915. The defendants were brought before the Justice and pleaded guilty, giving bail for an appeal. The cases are pending.

The following streams were patrolled during the month of September: Schuylkill river, Perkiomen, Valley, Chester, Crum and Skippack creeks. Received a complaint that a fish basket was being operated at Ryan's Mill, Bucks county. Upon investigation I found that such was not the case, but found the turbine wheels at the mill were not properly protected by a bar rack. I notified Mr. Ryan as to the conditions and it was very readily remedied.

In October I patrolled the following streams in Delaware, Berks, Chester and Montgomery counties: Ridley, Chester, Pickering, Skippack, Manatawny and Perkiomen creeks and the Schuylkill river. On October 29th, at the request of the Norristown Fish and Game Association, I went to Philadelphia and met a consignment of fish shipped from the Union City hatchery, and planted these fish in the Perkiomen creek. The consignment consisted of sunfish, yellow perch and bass. The sunfish, some of which were fully eight inches

in length were the finest I ever saw. The yellow perch and bass were also very fine.

In November I patrolled the following streams: Schuylkill river, Perkiomen and Skippack creeks.

Pursuant to a call from the Commissioner, on November 15th I went to Harrisburg to attend the Third Pennsylvania Welfare, Efficiency and Engineering Conference. This I am sure was a great benefit to all as it brought us in closer co-operation and showed us the workings of the different Departments. During this conference there was also held a meeting of the wardens, the work of the Department being taken up and arrangements being made to take up the pollution work. Such meetings as these are just what the wardens need as they bring them in closer touch with each other, and I am sure every warden will join me in thanking the Department for the kind instructions and assistance it has given us at all times.

The year just passed has been a very busy one for me, as I have been constantly on the go patrolling the various streams in this section of the Commonwealth. As we are not allotted any given territory our work is made so much the harder by having to go to all parts of the State. The people are beginning to realize that it is not only the wish of the Department to make arrests but to have the law obeyed. I find the people are well instructed in the law and for this reason few violations have occurred in this section.

Bass fishing was very good during the past season in the Perkiomen creek and the Schuylkill river, the people generally being well pleased with the work of the present administration as the fish which are shipped for stocking the streams are of such size that good results are bound to come.

The following is a summary of the streams which I have patrolled during the past year:

Montgomery County—The Perkiomen creek, Skippack creek, East and West Branch creeks, Mansell's run, a trout stream, the Schuylkill Canal and Schuylkill River.

Chester County—The Octoraro, Brandywine, Pickering and the French creeks, also a part of the Schuylkill river and Valley creek, a trout stream.

Berks County—The Schuylkill river and canal, Scotch run, a trout stream, and the Monocacy creek; also Hay creek.

Delaware County—The Chester, Crum, Ridley and Darby creeks.

Bucks County—The Delaware river, north and south of Trenton Falls, to Tohickon creek, from Quakertown to the Delaware river, also the Neshaminy creek.

The following are the arrests, convictions, etc.:

Arrests,	18
Convictions,	14
Jail sentences,	4
Discharged,	4
Appeals pending,	2
Fines imposed,	\$180 00
Fines paid,	140 00
Fines pending,	40 00

Very respectfully,

FRANK F. SAYLOR.

REPORT OF WARDEN R. O. McINTOSH.

Ridgway, Pa., November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—I have the honor to submit the following report of my work and observations as State fish warden for the year ending November 30, 1915.

The past year, in my estimation, has been one of success for the Department of Fisheries, as much work has been accomplished in bringing about the clarification of the streams of Pennsylvania.

The question of stream pollution is one of much magnitude, and a question which is not easily understood by the majority of the people of the Commonwealth and no one knows what it means until they are brought face to face with it as is the Department and its several wardens. The Department is gradually getting hold of this question and it is my hope, as an employe of the Department, that it will only be a short time until the streams will once more be pure and inhabited by fish.

With the experience that I have had in this work I feel sure that the new system of filtration which has been worked out by the Department will prove to be a great success and of much benefit to the Commonwealth.

It has been my duty to cover certain parts of the following counties for the purpose of enforcing the fish laws and to assist in the enforcement of the game and forestry laws, and to investigate complaints received by the Department. The following streams have been patrolled in the counties shown during the year just ended:

Cambria County.

Susquehanna and Conemaugh rivers, Stony, Paint, Mill, Bems, and South Branch of Black Lick creeks, Figart, Salt Lick, Hinston, Laurel, Black Lick, South Fork and Wilmore runs.

Somerset County.

Casselman river, Laurel Hill, Stony, Rhodes, Wills, Bens, Flaugherty, Coxes, Dark Shade, Clear Shade, Quemahoning, Mill and Brush creeks, Laurel, Shaeffer, Glades, Fishing, Jones, John, Kellers, Millers, Hooser, Pickings, Roaring, Calender and Clear runs.

Fayette County.

Youghiogheny and Monongahela rivers, Black, Dunlaps, and Indian creeks, Buck, Poplar and Brownfield runs.

Westmoreland County.

Conemaugh river, Crab Tree, Loyalhanna, Turtle, Mill, Pockets, Hannaries and Tub Mill Creeks, Four Mile, Three Mile, Lynn, McGees, Hendricks and McGinnis runs.

Greene County.

Browns, Bates and South Fork of Ten Mile creeks.

Washington County.

Monongahela river, Hoosongs, Turkey Fork, Middle Fork, Ten Mile and Raccoon creeks.

Warren County.

Allegheny river, Big Brokenstraw and Tionesta creeks, Two Mile, Arnot, Four Mile, Dunham, Crouse, Garland and Glade runs.

Potter County.

Kettle, Cross Fork creeks, and Hammersley Fork run.

Elk County.

Clarion river, Big Mill, Little Mill, Bear, Straights and Elk creeks, Five Mile, Johnson, Rocky, Wilson, Wolf, Powers, Daguscahonda, Mill, Birch, Decker, Laurel, Island and Gallagher runs.

Cameron County.

Driftwood, Clear and Sinnamahoning creeks and North run.

Clinton County.

Susquehanna river, Kettle creek and Hammersley Fork run.

McKean County.

Straights Creek, Two Mile, Wilson and Five Mile runs.

Blair County.

Tipton and Mountain runs.

Centre County.

Spring, Moshannon and Bald Eagle creeks and Buffalo run.

Clearfield County.

Susquehanna river, Little Clearfield, Anderson and Brubaker creeks and Beaver run.

Allegheny County.

Ohio river, Potato Garden run.

Beaver County.

Ohio river, Big Traverse, Little Traverse, Raccoon and Service creeks, and Longs run.

Butler County.

Bear creek.

Armstrong County.

Allegheny river, Bear creek and McAllister run.

Crawford County.

East and West Branches of Oil creek.

Clarion County.

Allegheny river, Clarion river, Paint and Deer creeks.

Also patrolled streams in Jefferson, Dauphin and Wayne Counties.

In patrolling the streams in the several counties above mentioned few violations have come to my notice owing to the great amount of rain which made the waters of the small streams exceptionally high during the past season, and the greater part of the fishing was confined to the larger streams. The numerous rains of the season seemed to act as a protection to the fish in the small streams, as the amount of fish food washed into the streams was sufficient to provide food for the fish thus making it difficult for the fishermen to catch very large numbers. The fact that very few fish were caught during the season is not a discredit to the Department as there are more fish in the streams now than in previous years, particularly in trout streams, and this is due to the restocking of the streams by the Department.

It has been my pleasure of meeting a few true sportsmen during the past season and find that those who have been taking an active part in the stocking of the streams are more than pleased with the large fish which have been received from the State under the present administration.

Some of the sportsmen speak of the pollution of the streams and have expressed their wishes for the success of the Department in handling this question. About nine out of every ten were in favor of the change of the fish code, most of them being in favor of a change relative to the size limit.

On September 1st I was directed to transfer my headquarters from Johnstown to Ridgway, and since taking up my new headquarters have spent considerable time investigating pollution on the Clarion river and its tributaries.

The clarification of the Clarion river is a very big proposition, but by taking up the tributaries and taking every manufacturing establishment on these tributaries and then taking up the main stream I hope in time to cover the entire river.

Located on the Clarion river and its tributaries are Oil Refineries, Chemical Works, Tanneries, Coal Mines and Soap Factories, the refuse from which is destructive to fish and fish food.

On several occasions during the year the Department has called meetings of the wardens for the purpose of bringing about better results in their line of work. These meetings have undoubtedly been a great benefit to all as they enabled each and every one to become better acquainted and to better co-operate with one another.

The Third Pennsylvania Welfare and Efficiency and Engineer's Conference which was held in the Hall of the House of Representatives, in the State Capitol, at Harrisburg, during the week of November 15th, at which Conference I had the pleasure of attending, was very instructive and I am sure was of much benefit to all.

During the month of May I assisted Warden Frank B. Whiteman in making several arrests in the vicinity of Brownsville, Fayette County, along the Ohio river. I also assisted Warden J. D. Sizer on pollution cases in Centre and Clearfield Counties during the month of July.

In addition to the number of pollution notices which I have served during the year just passed, the following prosecutions were brought for the violation of the fish laws:

Short trout, two.

Un-naturalized Foreign Born residents, two.

Illegal use of outlines, one.

Illegal size mesh in dip net, one.

Pollution, one.

Out of this number I secured six (6) convictions and three (3) of the defendants paying fines amounting to \$100.00; three being committed to jail and one acquitted.

I also distributed during the year a number of digests of the game, fish and forestry laws.

In pursuance of my duty as Warden I have on a number of occasions extinguished small forest fires which have come to my notice and also reported several violations of the game laws to the nearest game protector, or the Department.

The above report is respectfully submitted.

R. O. McINTOSH.

REPORT OF WARDEN J. D. SIZER.

Huntingdon, Pa., November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

I have the honor to respectfully submit the following report of my work during the year ending November 30, 1915:

The greater part of my time was taken up in patrolling the streams in the various counties in this section of the Commonwealth in which there are many streams that afford good fishing, and as the would-be violators knew that I was constantly patrolling these streams and on the watch for them, deterred many from violating the law.

Quite a few of our industries in Clearfield, Centre and Huntingdon counties, such as sand quarries, that have been running their wash water into the various streams thereby destroying the garden of the fish, have agreed to install purifying plants in accordance with the wishes of the Department. After going over this proposition very carefully with the superintendents and explaining the system of filtration which the Department has adopted, I have found that they are willing to install the filter as it will be a benefit both to the corporations, the Department of Fisheries and to the people generally. The sand which is caught in the filter I have advised can be sold as second class sand.

On February 3d I went to Grampian, Clearfield county, and served a notice on Boyd Crisman for allowing sawdust to run into a stream, and he agreed to stop the pollution and remove the sawdust pile. He evidently was in ignorance of the law as he claimed he did not know the law applied to sawdust.

On March 1, 1915, I made an arrest for using an illegal dip net on Crooked creek in Smithfield township, Huntingdon county. The defendant was brought before the Justice of the Peace, found guilty and paid a fine of \$20.00 and \$2.00 costs.

On March 30th I visited a sawmill at Burnside, Clearfield county, on a complaint received from the Department. Upon investigation I found that no sawdust was going into the stream, the owner claiming he knew the law, and that he had been stocking the streams for years and would report any person or persons he caught allowing any sawdust or refuse of any kind to get into the stream which would injure fish or fish life.

On April 15th I arrested three dynamiters at State College, Centre county. The defendants were brought before the Justice of the Peace and sentenced to pay a fine of \$100.00 each and costs. The defendants gave notice of appeal, the appeal being granted and the case is still pending.

On April 18th I made an arrest for fishing with a net in a wing-wall, which is in direct violation of the Act of May 1, 1909. The defendant was found guilty and in default of payment of fine of \$20.00 was committed to the county jail for 20 days.

On May 7th I made an arrest for catching trout undersize and a fine of \$10.00 was paid.

On May 11th an arrest was made for using a scoop net in Kettle creek. The defendant was found guilty and in default of payment of fine of \$20.00 was committed to the county jail for 20 days.

On May 20th an arrest was made for using a dip net from the breast of a dam and for stirring. The defendants were taken before a Justice of the Peace and fines were imposed upon the defendants amounting to \$100.00.

On June 5th on complaint of citizens in Blair county, prosecution was brought against the D. M. Bare Paper Company, of Roaring Springs, for violation of Section 16 of the Act of May 1, 1909. The Superintendent of the plant was taken before an alderman, was found guilty and fined \$100.00 and costs. The defendant took an appeal, but later on the appeal was withdrawn and the fine and costs paid.

On June 20th an arrest was made for using a gig, the defendant being fined \$20.00 and costs which were paid.

On July 8th the Tyrone Paper Mill was served with a pollution notice and the pollution was abated at once.

On July 16th I went to Lock Haven to investigate a complaint about a sawmill. When I arrived there a notice was served upon the owner and the sawdust was taken away from the banks of the stream.

An arrest for fishing on Sunday was made on April 18. The defendant was fined \$20.00 and costs which were paid.

On a complaint from the Department I went to Olanta, Clearfield county, to investigate a sawmill owned by Harry Cathcart. After explaining the law to the owner and notifying him to remove the sawdust, he refused to do so. I arrested him and took him before a Justice of the Peace. A fine of \$100.00 was imposed and the defendant gave notice of an appeal. The appeal was granted and the District Attorney called the case up before a Court of Quarter Sessions, the case being tried before the Grand Jury. The Grand Jury handed down a true bill. The attorney for the defendant raised the point that the Court of Quarter Sessions had no jurisdiction over a summary conviction, in which he was upheld. The case was continued until Argument Court and will be tried before the Court. The case is now pending.

On April 28th a notice was served upon the American Lime Stone Company, of Bellefonte, Centre county, directing them to discontinue the dumping of lime into Buffalo run. The Company agreed to clean it up at once, thereby complying with the law.

On August 20th a notice was served on the Elk Tanning Company, at Clearfield, directing them to clean the filter plant which was in very bad working order and which allowed the refuse to get into the stream. The filter was cleaned and was in good working order.

During the month of August I served several pollution notices advising the owners to install the system of filtration which the Department has adopted. In most of the cases the manufacturers readily agreed to do this as soon as the plans and data were furnished them.

On November 7th I went to Lock Haven to see that there were no violations of the fish laws while the Lock Haven Paper Company were drawing off the dam and the canal. I found set nets in the

canal basin with wings attached. I was assisted in this work by Warden F. B. Whiteman. The owner of the set nets was arrested, taken before a Justice of the Peace, found guilty and fined \$20.00. In default of payment of fine the defendant was committed to the county jail for 20 days. After serving three days in jail his fine was paid by outsiders.

During the month of November I patrolled various streams and served several pollution notices.

Owing to the extensive rainfall during the past year the streams have been exceptionally high, and for this reason the fishing has not been as good as it might have been, but next year there should be good fishing as the fish were protected by the streams being high.

Very respectfully,

J. D. SIZER.

REPORT OF WARDEN W. E. SHOEMAKER.

Laceyville, Pa., November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—I herewith submit my report for the year ending November 30, 1915.

The season just passed has been an exceptionally wet one. The streams for the greater part of the season were extremely high and part of the time "bank full," and for this reason practically no fishing was done until the later part of October, when some very fine catches of pike and rock bass and wall eyed pike were made between Pittston and Sayre, in the Susquehanna river.

Owing to the small force of wardens it is a difficult proposition to patrol the many streams and lakes in an effective manner. It is generally known that the Department has a small force of men to cover the entire Commonwealth and the people who are violators of the fish laws are constantly on the look-out and are being kept posted of the movements of the warden in his particular section, even going so far as telephoning to the Warden's residence to find out whether or not he is at home.

There were more reports of violations of fishing with outlines than for many years past. It has been difficult to get the evidence to convict the violators, as the informers are afraid to give evidence before the Justice of the Peace. The excuse which they give is "We do not care to be known as giving any information." I sometimes wish that we had a law similar to the one in New Jersey, which compels

one of the violators to give evidence to convict the others. If this law was on the statute books of Pennsylvania, good results could be accomplished by the wardens.

On account of the streams in this section being so high, owing to the excess amount of rain during the four months allowed to use a gig or spear, there were only a few nights that this class of fishermen could operate in the river, and as the creeks were about the same this applies to fishing in them also. For this reason very few fish were taken by the use of a gig or spear. This is shown from the fact that no complaints were made of any violations for this season for the illegal use of spears.

The parties at Towanda, known as the "Pools," opened up early in the spring with the use of dynamite, this being their usual way of securing fish. Mr. C. E. McCracken, County Detective, and one of the constables, managed to get hold of one of the dynamiters, brought him before the Justice of the Peace and the defendant was found guilty. One of the dynamiters found it to his advantage to go to New York State, and evidently the climate agrees with him as he has not yet returned. These arrests came as a complete surprise to the dynamiters and they have been extremely shy since. A short time later they were given another bad scare which had the desired effect.

From Pittston to Sayre, a distance of about ninety-five miles on the Susquehanna river, so far as I could see and learn there was not one set of wingwalls erected for the capture of eels, and the use of nets in the mouth of the wingwalls, this season, and not a single report of this nature being in the river on the North Branch above Pittston to the New York State line. This condition, to my knowledge, has never occurred, and it shows that the parties who insist upon using these wingwalls in violation of the law have finally learned that the Department means business.

In the early part of May many reports were sent to me complaining that persons were using from one to two hundred poles and lines, stuck in the mud in place of out-lines to catch bullheads, before it was legal to use out-lines. However, this information reached me too late to get any evidence sufficient to convict, or no one who would swear to the violation.

The new law passed April 21, 1915, prohibiting un-naturalized foreign born residents from fishing in the waters in the Commonwealth of Pennsylvania has worked out better in this section than was expected, where hundreds of this class of fishermen were on the streams and ponds every time there was a "shut-down" at the mines. Seven convictions in Lackawanna county and two in Wyoming county apparently had the desired effect. At first warnings were given to these people, as the Department did not wish to take advantage of ignorance and after the warnings were given more drastic measures were taken when it was found that no attention was paid to the warnings, but when they found that they had to part with some of their hard earned money they kept away from the streams and no more was heard of them.

Further down the river there is a crowd who use seines and from the information obtainable they operate during the night. They arrive at their destination some time during the night, coming in automobiles, and before a warden is able to get on the field of operation

they have flown. If the warden's had the right to get a search warrant it would be an easy matter to locate the seines used and then the seines and outlines could be confiscated.

The question of the enforcement of Section 16 of the Act of May 1, 1909, P. L. 353, which gives the Department the power to prosecute for pollution of the streams has been rather difficult up until a few months ago, owing to the fact that there was no system which could be recommended for the taking care of the refuse which was allowed to run into the streams by the various manufacturing establishments located along the streams. The new system of filtration which has been approved by the Department, in my opinion is a step in the right direction and will in time clear up the streams. Many of the manufacturers in my section of the State are waiting for the blue prints and the necessary data and probably by the time this report goes to print these blue prints and data will be available.

The tannery located at Middleburg, after many years of experiment with the different ways of filtration, finally, early in the spring of this year, placed a filter in operation which up to this date is doing good work, but owing to the advance of the price of alum from \$8.00 per ton to \$28.00 per ton, this company will install the new system of filtration which the Department has adopted.

Myron E. Shoemaker, acting as special fish warden, has done much good work during the past year, having made several arrests while working with me that one man alone would have been unable to make. He especially kept one dynamiter from leaving the State until a warrant could be secured for his arrest and he was later convicted.

Thirty-four (34) arrests were made during the year and a conviction was secured in every case. Only two of the defendants standing for a hearing before a justice; all of the others pleaded guilty in order to save costs. The following are the arrests made:

- Operating fish baskets in the Delaware river, three.
- Resisting arrest, one.
- Illegal use of out-lines, thirteen.
- Un-Naturalized foreign born residents, nine.
- Dynamiting, two.
- Sunday fishing, two.
- Short game fish, one.
- Illegal use of hand lines, two.
- Pollution, one.

Twenty-six (26) tanneries have been looked after at different times, some of them being visited two or three times each during the past year. I have also visited the following: Six silk mills, twenty creameries, four dye works, fifteen sawmills, six cider mills, three manufacturing plants where ashes were being thrown into the stream, one plant where gravel and sand were being washed into the stream.

At one of the large tanneries I visited considerable profane language and abuse of the wardens and the Department was heard, but I am pleased to say that this was the only place where any disrespect was shown me when a request was made to stop the pollution. In the majority of cases the manufacturer is willing to co-operate with the Department and since the adoption of the new filtration system they are anxious and willing to do anything to prevent the pollution of the streams.

One large fyke net was found in a trout stream and one large net was found which measured nearly six feet across the mouth. I did not find the owners as it is impossible to stay around and wait for the owners to come along as it is impossible to know when they are coming. Three or four out-lines were also found which were being used out of season and I had no way of getting the owners. The out-lines were taken up and confiscated, together with fifteen other out-lines confiscated during the year.

In view of the fact that in every case of arrest made for illegal fishing with out-lines where the defendants were willing to go before a Justice of the Peace and plead guilty, their boats were returned to them with the promise that they would not again violate the fish laws.

With the limited appropriation available for salaries and expenses of wardens, as much territory as could be expected was patrolled under the conditions.

The conditions existing this season, owing to so much high water, is bound to make better fishing next season in this section of the State.

More wall eyed pike were caught this season than ever before and a great many of these fish were planted in the Susquehanna river in the early spring. When we were out at night to get stone catfish with wire screens (These screens are put on a frame about two feet wide and the operator runs through shallow water) it was very frequent that we would catch as many as fifteen or twenty of the small pike at one rush through the water. There was also a good catch of black bass this season. Apparently the black bass are holding their own while the pike are rapidly increasing. If all the devices could be eliminated with the exception of the rod, hook and line and the hand line, and such a law lived up to, we would soon have plenty of fish in the streams for all who wish to go fishing.

The act passed by the recent Legislature giving the wardens the power to act in enforcing the game and forestry laws makes some extra work for the wardens, but it is a good law and gives us an opportunity of co-operating with each other and to better enforce the laws.

The above is respectfully submitted.

W. E. SHOEMAKER.

REPORT OF ALEX MacDONALD.

Eric, Pa., November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—I have the honor to herewith submit my report for the year ending November 30, 1915.

During the first half of December I assisted in the gathering of spawn on Lake Erie and the latter part of the month was taken up

in patrolling the Bay and ponds on Presque Isle Peninsula, and looking after the fish markets where I had found game fish at various times.

During the months of January and February I patrolled Presque Isle Bay and the ponds on the Peninsula, also Edinboro Lake, Waterford Sugar Lake and French creek, in the vicinity of Meadville, and Conneaut Lake. Found several violations of the fish laws and arrested the guilty parties, who when brought before a Justice of the Peace were found guilty and the fine imposed according to law.

I accompanied Warden J. P. Albert in investigating pollution of streams in this vicinity, and investigated the furnaces, paper mills and other manufacturing establishments along the Lake Front who were polluting the Bay. The pound nets used by the fishermen along the Lake shore were gone over very carefully by me to see that they were within the law.

During the months of March and April was compelled to do much night work on the Lake for illegal fishing. Signs were posted on Presque Isle Peninsula setting forth the rules and regulations as laid down by the Department. I patrolled the shores of Lake Erie from the New York State line to the Ohio State line, covering all streams which entered the lake between these two points.

During the month of May I was compelled to spend much time in making the un-naturalized foreign born resident familiar with the law passed by the recent Legislature, which prohibits the un-naturalized foreign born resident from fishing in the waters of this Commonwealth. I explained the law to more than three hundred of these men who had been in the habit of fishing prior to the passage of this act and was successful in having them obey the law to such an extent that it was not necessary to make one arrest. The new law has been very beneficial in this part of the Commonwealth as it has made many citizens of the un-naturalized person, and I found that by using tact and patience with this foreign born element that I could do more than by making arrests, and I believe this is the wish of the Department. Whenever I come across one of them and ask if they are citizens they very readily show their papers to me and remark "I remember when you sent me home."

The first part of June was taken up working on Presque Isle Peninsula and on the ponds, tacking signs, looking after the house-boats and removing wire cables from the trees, which were used formerly to fasten the house-boats. During the latter part of June much of my work was done at night patrolling the Bay and Peninsula. I confiscated two row boats and twenty-four carp nets valued at \$3.00 per net. The fish found in the nets valued at \$9.50, which were sold and the money turned into the State Treasurer. The boats confiscated were returned to the owners after I satisfied myself that they were stolen for this purpose. Several other arrests were made during this time. The night work continued through the month of July and many inland trips were made to Edinboro, Meadville and Waterford, investigating complaints of illegal fishing.

During the month of August I patrolled the Bay, tacking signs on the Peninsula and measuring gill nets, and seining for the Department, &c. I was called to Pleasant Mount to attend a meeting of the wardens, which was very beneficial to me.

During the first part of September my time was taken up attending the fish exhibit which the Department had at the Conneaut Lake Fair. This exhibit, as usual, attracted much favorable attention. During the month I patrolled the Bay and the Peninsula and measured twine used by the fishermen. I found two boats with nets of illegal size and after satisfying myself that it was not done with the intention of violating the law, no arrest was made. The boats came from Vermillion, Ohio and Dunkirk, N. Y. I advised the men in charge of the boats to return to their home ports at once, which they did.

During the month of October I patrolled the Bay and the Peninsula measuring nets, &c., and visited a grape juice and canning factory located at North East, and one sawmill at Branchville, Pa.

During the month of November much of my time was taken up in measuring twine and seeing that the fish law was lived up to. During the week of November 15th I attended the Third Pennsylvania Industrial and Public Welfare and Engineering Conference, which was held in the House of Representatives at the Capitol, at Harrisburg. During this week a meeting of the wardens was called by the Commissioner, N. R. Buller. The latter part of the month was spent around the fish houses and tugs inspecting the fish for spawn.

During the year I distributed and explained the law contained in the digest of the game, fish and forestry laws to hundreds of fishermen.

The year just passed has been the best with regards to fishing than any year to my knowledge and this is due without a doubt to the artificial propagation which is carried on by the Department through its Lake Erie Fish Hatchery.

Following are the arrests, amount of fines, &c., during the year:

Game fish out of season,	6
Fishing with seine,	3
Outlines,	4
Confiscated boats,	2
Confiscated carp nets,	24
Confiscated carp valued at,	\$10 30
Amount of fines,	\$200 30

Respectfully,

ALEX MacDONALD.

REPORT OF WARDEN FRANK B. WHITEMAN.

Roaring Spring, Pa., November 30, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—I herewith submit my report as State fish warden from March 1st to November 30th, 1915:

Owing to the small force of wardens which the Department has at its command, the past year has been a very busy one for me, and I have patrolled streams in various parts of the State, most of it, however, being done in the western part.

During the year I reported to the Department cases of pollution of the streams in Blair, Cambria, Somerset, Bedford, Fayette, Washington, Westmoreland, Greene, Clinton, Huntingdon, Lancaster and Lebanon counties. The following streams were patrolled in the counties shown:

Blair county: Juniata river and tributaries; Spring Meadow run; Blair's creek; Mill run; Bell's run; Tipton run.

Bedford county: Little Will's creek; Tar water; Yellow creek and tributaries; New Baltimore creek.

Cambria county: Laurel run; Clearfield creek; Wilmore creek; South Fork run; Tubmills run.

Somerset county: Big Will's creek; Wolf run; Piney run; Tubmill run; White's creek.

Southern part of Huntingdon county: Raystown Branch and tributaries; Shafer creek; Spruce creek.

Clinton county: Bald Eagle creek.

Fayette county: Indiana creek; Dunbar creek.

Washington county: Monongahela river.

Greene county: Ten Mile creek; Dunkard creek; Big and Little Whitney creek.

Lancaster county: Muddy creek.

Lebanon: Little Swatara river.

Westmoreland county: Roaring run; Linn run.

The question of the pollution of the streams of the Commonwealth is a very serious and big question. Section 16 of the Act of May 1, 1909, gives the Department of Fisheries the power to compel manufacturers and mine owners to take such steps as will keep the refuse from their plants out of the streams. The Department has in the past been handicapped in this work from the fact that it did not have any system which it could recommend for taking care of the refuse, but during the past few months a system of filtration has been adopted by the Department, and from the instructions which I have received I believe this system will do the work and in time clarify

the streams. During the past year I have served notices on the following:

John Shoemaker, sawdust, Mill creek.

Jacob Paul, sawdust, Sandpatch.

West Penn Electric, ashes, Connellsville.

Mohn Bros., dye and acid, Adamstown.

Pierce Mohn, dye, Adamstown.

George Bollman, dye, Adamstown.

Stork Bros., dye, Adamstown.

F. & M. Hat Factory, acid, Denver.

George Henderson & Co., acid and dye, Shillington.

Irvin Moser, dye, Mohnton.

Electric Hosiery Co., dye, Mohnton.

Gem Hosiery, dye, Mohnton.

J. C. Kisler & Co., dye, Mohnton.

Industrial Hosiery Mill, dye, Mohnton.

Gloninger & Gloninger, ashes, Williams Station.

Percy Allan Rose Brickyard, ashes, Williams Station.

In this section of the Commonwealth I have to contend with tanneries, paper mills, coal mines, chemical mills, tin plate mills, furnaces and iron works. I have found that most of the manufacturers are willing to co-operate with the Department in its work of clarifying the streams.

During the year I made 25 arrests, securing 25 convictions and fines amounting to \$430.00 were paid. All kinds of violations of the fish laws are made in this section of the Commonwealth. However, the conditions are very much improved over former years.

The most destructive way of fishing, in my judgment as a fish warden, having 15 years experience in this work, is gigging and seining. When the seine is pulled on the shore thousands of small fish are left lying on the ground high and dry, and no way of getting back in the streams, the result being that many fish are killed in this manner. The fyke net also is a very destructive means of taking fish. The consensus of opinion among the sportsmen in this section is that a law should be passed eliminating gigging, seining and fyke netting. Since the eel basket law has been repealed I have not come across many violations in this respect.

Fishing in general has improved 30 per cent. within the last two years, and the sportsmen give the Department much credit as the fish which are being sent out are of such size that when planted they are able to take care of themselves, and the sportsmen when they receive a consignment from the hatchery are well pleased with them.

Very respectfully,

FRANK B. WHITEMAN.

SPECIAL FISH WARDENS.

Under the provisions of Section 30, of the Act of May 1, 1909, the Commissioner of Fisheries may on the written application of a properly organized fish protective association, or of any association or individual owning or leasing waters, appoint one or more special fish wardens for the county in which the application is made. These appointments expire on the thirty-first day of May of each year.

Under the provisions of this Act special fish wardens receive no salary or compensation from the Commonwealth for their services, unless detained by the Commissioner of Fisheries for duty, in which case a per diem allowance is made. Special fish wardens receive no part of any fine or fines imposed or paid under the provisions of this act.

There were sixty-two special fish wardens appointed during the year dating from May 31, 1915 up to the date of this report. The appointment of these men have a good moral effect in the community in which they are appointed and the Department is pleased to say that much good work has been done by these men and heartily co-operates with them in enforcing the fish laws.

The following list shows the appointments made from May 31, 1915:

Name.	Residence.	County for Which Appointed.
Maurice Meagher,	Unlondale,	Wayne.
Myron E. Shoemaker,	Laceyville,	Wyoming-Bradford.
Edgar W. Davis,	Scranton,	Lackawanna-Monroe. Pike.
William Allen,	Johnstown,	Cambria.
H. J. Frederick,	Hosensack,	Lehigh.
George W. Seglin,	Saylorsburg,	Monroe.
Edwin F. Haney,	Saylorsburg,	Monroe.
Edwin F. Kunkle,	Saylorsburg,	Monroe.
James K. Tittle,	Bartonsville,	Monroe.
Matthew H. Jones,	Cresco,	Monroe.
John C. Gouldy,	Graters Ford,	Montgomery.
A. Pfeuger,	Yerkes,	Montgomery.
B. Wilson Cox,	Plymouth Meeting,	Montgomery.
William L. Gotwals,	Norristown,	Montgomery.
William G. Bayle,	Altoona,	Blair.
Benjamin DeTurk,	Altoona,	Blair.
A. Russell Butt,	Altoona,	Blair.
O. R. Seedenburg,	Altoona,	Blair.
J. R. Lewis,	Altoona,	Blair.
J. H. Winters,	Altoona,	Blair.
Thomas Butterbaugh,	South Lakemount,	Blair.
C. E. Albright,	Roaring Springs,	Blair.
William Bauman,	Meyersdale,	Somerset.
V. E. Hartle,	Meyersdale,	Somerset.
Howard Philips,	Meyersdale,	Somerset.
Gene Rosenberger,	Meyersdale,	Somerset.
Sam Rosenberger,	Meyersdale,	Somerset.
Ernest Blocher,	Elk Lick,	Somerset.
Clarence Statler,	Elk Lick,	Somerset.
J. C. Trent,	Elk Lick,	Somerset.
O. M. May,	Elk Lick,	Somerset.
William Schram,	Elk Lick,	Somerset.
William Hendricks,	Doylestown,	Bucks.
Frank A. LeFevre,	New Britain,	Bucks.
Henry H. Randt,	Pipersville,	Bucks.
Albert R. Atkinson,	Doylestown,	Bucks.
J. C. Vogel,	Philadelphia,	Bucks.
O. S. Keihl,	Pansy,	Jefferson.
L. T. Enty,	Pansy,	Jefferson.

Name.	Residence.	County for Which Appointed.
Edward K. Kennedy,	Cherry Tree,	Indiana.
A. W. Creary,	Cherry Tree,	Indiana.
C. M. Sweitzer,	Cherry Tree,	Indiana.
F. R. London,	Cherry Tree,	Indiana.
Worth Tonkin,	Cherry Tree,	Indiana.
W. T. Hunt,	West Chester,	Chester.
Fred. D. Brown,	Eagle Rock,	Venango.
D. C. Cochran,	State College,	Centre.
E. S. Krause,	East Greenville,	Montgomery.
Charles L. Lawrence,	McSherrystown,	Adams.
Clayton N. Myers,	McSherrystown,	Adams.
Senius Johnson,	Erie,	Erie.
Horace Rowland,	Philadelphia,	Philadelphia-Bucks.
Ellwood Van Horn,	Philadelphia,	Philadelphia-Bucks.
John Mills,	Duryea,	Luzerne.
Harry Frost,	Duryea,	Luzerne.
George McCormick,	Chester,	Delaware.
George V. Klegg,	Chester,	Delaware.
Charles Lindauer,	Spring City,	Chester.
Benjamin Vallette,	Philadelphia,	Philadelphia.
E. A. Kemmerling,	Wilkinsburg,	Allegheny.
George L. Peppel,	Phoenixville,	Chester.
W. A. Turner,	Twin Lakes,	Pike.

REPORT OF SPECIAL WARDEN EDGAR W. DAVIS.

Scranton, Pa., November 30, 1915.

Hon. Nathan R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—The following is my report as special warden from April 1st to November 30, 1915:

In April I patrolled the following streams: Spring Brook and tributaries; Roaring Brook and tributaries; Paupac; Lehigh and tributaries; Broadhead's creek and the Susquehanna river.

I made numerous examinations and found the trout laws well observed by sportsmen, but had numerous complaints of netting, dynamiting and outlining being done in various places, but owing to the informants not being willing to testify against these violators (for various reasons) evidence to convict was impossible to get.

I spent several nights at the places complained of and while unable to catch any one, the fact that they were being watched and being discovered in some way has made such violations less frequent.

On May 26th I arrested Dimitra Ywanus for illegal fishing. He was found guilty and fined \$40.00 and costs, but was released through error on the part of the alderman.

On same date I arrested Hayden Davis for illegal fishing. He was found guilty and fined \$40.00 and costs, fine being remitted by the alderman.

On May 31st I arrested John Jones for illegal fishing. He was found guilty and fined \$20.00 and costs which were paid.

On the same date I arrested William Jones for same offense. He too was found guilty and fined \$20.00 and costs which were paid.

June 12th arrested Marion Gregorg for illegal fishing. He was fined \$10.00 and costs which were paid.

June 19th, assisted by David Pritchard and William Anneman, I arrested Daniel Bush, Sammel Bush, George H. Bush and Charles C. Price, for outlying Broadhead's creek. They were fined \$20.00 each and costs which were paid.

July 23d I arrested William Bordin and Archer Phillips for fishing on Sunday. They were fined \$20.00 and costs each and in default were committed to jail for 20 days.

July 31st I arrested C. F. Ehrhardt and F. W. Ehrhardt for taking trout with hands. They were fined \$10.00 and costs each which were paid.

August 21st I arrested Joseph Neil, Joseph Mericca and Vichi Colass for having fish undersize. They were fined \$10.00 each and costs which were paid.

August 23d I arrested Anthony Novitski, an alien, for taking game fish on an outline. He was fined \$40.00 and costs in default of which he was committed to jail.

October 19th I arrested P. H. Durkin and W. G. Loomis for using undersize yellow perch for bait. The case was dismissed by the alderman on account of insufficient evidence.

On account of the prominence of the above named men and the publicity given the case, although acquitted, it will have a good effect on this particular class of violations.

On November 22d I served notice on M. D. Potter, of Fleetville, to stop polluting a tributary of State's creek with sawdust from his mill. Later I found upon investigation that he had complied with the request.

Trout fishing has been as good or better in this locality the past season than it has been in many years. This can be attributed to the interest the sportsmen take in planting and caring for fish and the size of the fish distributed by the Department.

I have investigated several complaints of dams located on trout streams with no fishways, and I think trout fishing would be still better if this evil could be remedied.

The following is a summary of arrests and dispositions of cases:

Arrests,	19
Convictions,	17
Jail,	3
Discharged,	2
Fines imposed,	\$340 00
Fines paid,	180 00
Fines pending,	40 00

Respectfully submitted,

EDGAR W. DAVIS.

UNNATURALIZED FOREIGN BORN RESIDENTS.

During the session of the 1915 Legislature there was enacted a law which the Department believes is a step in the right direction and which will bring good results. The law prohibits unnaturalized foreign born residents from fishing in the waters within the Commonwealth of Pennsylvania. The Department, after the enactment of this law, took up an educational campaign, and instructed its wardens not to arrest the ignorant, but to advise and instruct them in the law. It also sent to the railroads and other employers of the unnaturalized foreign born resident, letters calling their attention to the act and requesting them to post notices, or otherwise notify their employes of the provisions of this act, which in every instance they readily did. The following is the law:

AN ACT

To give additional protection to the fish in the waters within the Commonwealth of Pennsylvania; prohibiting the fishing for, or capture or killing of, such fish by unnaturalized foreign born residents; and prescribing penalties for violation of its provisions.

Section 1. Be it enacted, &c., That from and after the passage of this act, it shall be unlawful for any unnaturalized foreign born resident to go fishing for, or capture or kill, in this Commonwealth, any fish of any description. Each and every person violating any provisions of this section shall, upon conviction thereof be sentenced to pay a penalty of twenty dollars for each offense, or undergo imprisonment in the common jail of the county for the period of one day for each dollar of penalty imposed.

Section 2. For the purpose of this act, any unnaturalized foreign born person who shall reside or live within the boundaries of the Commonwealth of Pennsylvania for ten consecutive days, shall be considered a resident, and shall be liable to the penalties imposed for violation of the provision of this act.

Section 3. From and after the passage of this act, any justice of the peace, alderman, or magistrate, upon information or complaint made to him by affidavit of one or more persons, charging any person or persons with having violated the provisions of this act, is hereby authorized and required to issue his warrant, under his hand and seal, directed to any constable, peace officer, or warden, and cause such person or persons to be arrested and brought before such justice, alderman, or magistrate, who shall hear and determine the guilt or innocence of the person or persons so charged; and, if convicted upon such charge, shall be sentenced by said justice, alderman, or magistrate, severally, to pay the fine or fines, penalty or penalties, provided in this act for such violations, together with the costs of suit. The whole of said fine shall be paid over forthwith to the treasurer of the county in which the prosecution was brought, and said county treasurer shall pay over the same forthwith to the Commissioner of

Fisheries, for the benefit of the Commonwealth: Provided, That, in case the defendant or defendants shall neglect to pay at once the fine or fines so imposed, said defendant or defendants shall forthwith be sentenced to undergo imprisonment in the county jail of the county where such conviction takes place, for the period of one day for each dollar of fine so imposed and unpaid, unless the defendant or defendants, upon conviction, shall give notice of intention to appeal; when such defendant or defendants shall be permitted to enter into good and sufficient recognizance to appear before such justice, alderman, or magistrate, on or before the expiration of five days, if such appeal is not taken by them, or on the final determination of such appeal if it be not sustained, for execution of sentence: Provided also, That all actions for any violation of any of the provisions of this act must be taken within one year from the time the offense was committed; and, when necessary to properly conduct any case before any alderman, justice of the peace, magistrate, or any court, the Commissioner of Fisheries is authorized to employ legal counsel.

Section 4. From and after the passage of this act, any fish commissioner, fish warden, deputy warden, sheriff, deputy sheriff, constable, or any special officer, or any peace officer in this Commonwealth, is hereby authorized and commanded to forthwith apprehend and arrest any person or persons who may be guilty of violating the provisions of this act, and take such person or persons before any justice of the peace, alderman, or magistrate, and thereupon make charge of such violation of this act; and the justice of the peace, alderman, or magistrate shall forthwith hear and determine the charge, as provided in section three of this act, and, in case any fish commissioner, fish warden, or any officer named above fails to prove his case, and the defendant or defendants are discharged; or, in case the defendant or defendants are convicted, and are sent to jail in lieu of the payment of fine or fines, penalty or penalties, the county in which the case is heard shall pay the costs. Such arrests may also be made on Sunday, in which case the person or persons, so arrested, for safe keeping may be committed to the jail or lock up for that day, but shall be taken before the proper magistrate and proceeded against on a weekday following the arrest.

CARP LICENSES.

Under the provisions of section 12 of the Act of April 18, 1913, P. L. 100, as amended by the Act of May 14, 1915, P. L. 521, the Department of Fisheries issued for the year 1915, for use in Presque Isle Bay, twenty-five Carp Licenses. The amount of revenue derived from the issuing of these licenses amounted to \$125.00, and the number of pounds caught by the holders of the licenses amounted to 79,856 pounds, valued at \$807.83.

CONCLUSION.

In closing my report I desire to extend to the Board of Fishery Commission, Superintendents of the Hatcheries, my Chief Clerk, Wardens, and my office assistants, my sincere thanks and gratitude for their hearty co-operation and assistance in the work of the Department during the year just passed. Co-operation is very essential in the work of the Department of Fisheries and I am glad to say that it has been extended to me at all times by those connected with the Department.

The amount appropriated for the traveling expenses for the Board of Fishery Commission is not commensurate for the work the members are called upon to do, and this amount should be increased by the next Legislature. The members of the Board devote their time and labor to their work and they should at least be compensated for their traveling expenses incurred in the many duties impressed upon them.

I also wish to extend to you my sincere thanks for the many courtesies received at your hands and assure you that it will be my aim to co-operate with you in every way possible.

Respectfully,

N. R. BULLER,
Commissioner of Fisheries.

THIRD PENNSYLVANIA WELFARE, EFFICIENCY AND ENGINEERING CONFERENCE.

During the week of November 15th the Third Pennsylvania Welfare, Efficiency and Engineering Conference was held in the Hall of the House of Representatives in the State Capitol, at Harrisburg, Pa. This Conference was called for the purpose of familiarizing the public and the various Departments of the State Government with the work of the separate departments which have to do in a responsible manner with State engineering projects, natural resources and industries.

The Conference was opened by an address by the Governor, Hon. Martin G. Brumbaugh, and a very interesting program followed throughout the entire Conference.

On Tuesday, November 16, the following address was delivered by the Commissioner of Fisheries:

"Mr. Chairman, Ladies and Gentlemen: It affords me much pleasure to stand before this large audience composed of members of the State Government and others who are interested in our work and who have come to listen to what we have to tell them about our work in the various branches of the State Government and to help us all to become better acquainted with each other's work and with each other and thus bring about the co-operation which should exist, and I sincerely trust that this Conference will bring about a closer relation between the various Departments and the public. My part of the program this afternoon is to explain to you the purposes of the Pennsylvania Department of Fisheries, and why it is part of the State Government. I will endeavor to do this with your indulgence and I hope my remarks will prove interesting to you.

The Department of Fisheries was organized under the provisions of the Act of April 2, 1903. The act authorized the appointment of a Commissioner of Fisheries and four other citizens of the Commonwealth, who together should constitute the Fisheries Commission. It also authorized the appointment of a clerk and stenographer and the Department was empowered to take charge of all hatching and fish cultural stations in this Commonwealth.

The duties of the Department of Fisheries is to provide for the protection and propagation of fish and to promote and encourage the development of the fishery interests of the Commonwealth, and to obtain and publish information respecting the extent and conditions of the fisheries of the Commonwealth; make rules and regulations for the enforcement of all laws designed for the protection, extension and propagation of fish.

The Commissioner of Fisheries is the president and executive officer of the Fisheries Commission, and is also chief superintendent of all hatching stations and fish cultural establishments, now existing or which may hereafter be established. He has full control, direction and management of all fish wardens, or water bailiffs; and he shall assume full charge of the work of the enforcement of the laws relating to the protection, propagation and distribution of fish and all fish wardens, constables, police, sheriffs and guardians of the peace, shall make prompt report to him of all cases of violation of the laws relating to fish.

The Department has under its control six hatcheries, which are devoted to the hatching and propagation of fish. These establishments are located in Erie, Centre, Wayne and Philadelphia counties and are each in charge of a superintendent, said superintendent being responsible for the operation of the hatchery to the Commissioner of Fisheries.

Experience has shown that economy in any business is only attained by the use of the latest and most improved methods, and the Department, since my incumbency, has devoted much time and labor to the rehabilitation of the hatcheries, to bring them up to the highest point of efficiency, so that they will be entirely up-to-date in every way for the propagation of fish and when they are completed will be a credit to the Commonwealth. The old wooden structures are being replaced by substantial buildings of concrete, brick and steel.

The next factor is efficiency, because without efficient workmen the best implements are no better than poor ones. It is here that the Department finds it is badly handicapped, on account of all the hatcheries being undermanned.

The work of the fish culturist is hard and the hours long, and it is only after years of training that a man attains efficiency which is so essential in the propagation of fish. The men are not only overworked, but are unable from the fewness of their number to get all out of the hatcheries that the hatcheries would do if properly manned. Lack of appropriations accounts for this condition. Too much water running through in a trough or battery would mean destruction to millions of eggs or fish, and the same would result from the stoppage of the water. Hence the troughs and batteries must be under the constant and trained eye of some one all the time. The attendant must be always on the alert to detect the first symptoms of trouble among his charges, and be ready at an instant to meet the trouble. Contagion spreads like wild fire and a sudden eruption of algae will undo the work of months. In the matter of shipping fish the messenger must be one who understands the habits of his charges, and see to it that the water is aerated and at the proper temperature, for without this only dead fish will reach the recipient. The messenger, it might be well to state, accompanies the fish from the time they are placed on the train in the shipping cans at the hatchery until the last can of fish is delivered to the applicant, often times making it necessary for the messenger to be on duty all night and part of the next day without any sleep. Each applicant is requested to report to the Department the condition of the fish when they are received. In this way the Department is in possession of much valuable information which assists it in its work.

It has been difficult to obtain men in the employ of the Department owing to the inadequate salaries that the Department is able to pay under the appropriations made by the Legislature. The result has been as the men are trained by the Department and become efficient they are sought for and bought up by offers of a much higher salary than the Department is able to pay. The result is that the Department makes the man and someone else gets the benefit of his training.

What is true of the hatcheries is true of the field work. Field work is really as important as the work at the hatcheries. Field work means the gathering of the spawn from the fish in the natural waters that would be otherwise entirely wasted and lost. The millions of eggs gathered at Erie would be entirely wasted were it not for the efforts of the Pennsylvania Department of Fisheries in collecting them, hatching them and planting the young fish in the lake. This is shown by the fact that the supply of fish is kept up and that the port of Erie today is the largest fresh water fish market in the world, yet Pennsylvania has only 40 miles of shore line on the lake. The people of Pennsylvania should be proud of this distinction as it means much to the Commonwealth in the commercial and business world. The amount of nets that are set every day run into hundreds of miles and the production of fish last year was 9,205,767 pounds, valued at wholesale at \$393,700.48, or about 4½ cents per pound. These figures convey forcibly the value of the fish business in Lake Erie, where the City of Erie is only one of a number of fishing ports. The value of

the boats and tackle used in taking the fish and the warehouses where they are handled runs into millions of dollars and gives employment to hundreds of men.

The most remarkable thing, however, in this matter and one in which the Pennsylvania Department of Fisheries takes pride is the fact that all this immense business is due to the artificial propagation of fish by this Department and the United States Government and other States, and the whole restocking is done by saving of the eggs which would be a waste product if it were not for the work of the hatchery men. There is not the slightest question in the mind of any fisherman as to the value of the work done by the Pennsylvania Department of Fisheries in this matter, because it was not many years ago, before the artificial propagation was taken up, that the catch of fish had so fallen off that the pursuit of fishing was no longer profitable.

The figures given above do not convey entirely the immensity of the business because they show the wholesale prices and the persons who use this large supply pay from 50 to 100 per cent. advance on these figures on account of freight and the handling of the fish by the fish dealers at their respective homes. Taken altogether the fish industry at Erie is a most valuable object lesson as to the value of artificial propagation of fish in furnishing a very important food supply to the people. If Lake Erie with the tremendous drain made upon it by the fishermen can be kept stocked with fish it shows that the other lakes and streams in Pennsylvania can also be restocked to their former productiveness if the hatcheries are worked to their full capacity and the fishermen observe the laws against wasteful and destructive methods of fishing.

Another duty which devolves upon the Department is the enforcement of the laws governing the protection of fish in our streams. The enforcement of the law comes under the small force of wardens which the Department is able to employ. The law allows the appointment of 30 citizens to act as fish wardens, but unfortunately the Legislature only appropriated sufficient money to employ regularly ten men. This small force is expected to cover this great Commonwealth of ours with its numberless miles of streams and every warden is obliged to hold himself in readiness to go to any part of the Commonwealth on a moment's notice. This very largely increases the traveling expenses pro rata, because the men have to travel such long distances. It is hoped that the importance of this branch of the work of the Department will be realized and enough money appropriated to allow the employment of the thirty men. The wardens also have to look after the pollution of the streams and are now giving this their serious and careful attention. This is the most serious and stupendous question which the Department is called upon to face and is giving it serious thought. Under the provisions of the Act of May 1, 1909, the Department is given the authority to keep the streams clear of pollution.

Before the white man took up his residence in Pennsylvania all the water in the lakes and streams was pure and undefiled, fitted for man to drink, for the cattle to quench their thirst, and for the fish to live and prosper. There is no greater chemist than Dame Nature herself, and she works with a will and earnestness that should excite the emulation of man.

When a tree fell in the forests the oxygen in the air proceeded to make it useful, and the carbonic acid resulting from the work of the oxygen was taken up by the growing tree alongside of the fallen one, and the carbon converted into plant life, while the oxygen was once more given off free to the air to again resume its chemical work. Similar processes were transformed so that from day to day there was an everlasting work of the chemical forces to destroy those things which have lived their lives and to build up those which were beginning their lives.

Nothing in nature is without its use. If the trees and brush along the streams and lakes, in course of time, fall into the waters they become shelters in which the small fish could hide, the microscopic animalculae on which the little fish lived could propagate and thus subserve a useful end. There was no trash in those days when nature ruled supreme and man did not intervene his wasteful hand.

With the coming of man all these things changed. He saw only those things which he could convert instantly into value and carelessly allowed to run away everything that could not be turned into instant use without some extra course of treatment. In the mountain side a spring of pure cold water gushed forth and started for its trip to the ocean with as unerring an instinct as that which inspires the tendril of the pea vine to reach out for a support that it may climb heavenward.

The rill of water increases and grows as it pursues its way joined by other little rills until it becomes a creek, and then winds out to the river. In the clear, cold spring water nature planted that most gorgeous dandy of our native fishes, the brook trout, and he thrived and flourished, leaping in the ecstasy of the joys of life that he might rival in a show of gleaming colors the sunbeams that played upon the ripples that his antics started. As the stream grew wider, the water warmed under the sun's rays and the trout refused longer to dwell in the waters which enervated him as the Turkish bath enervates its devotees. Nature placed in these warmer waters the black bass and Susquehanna salmon. It also placed in the warmer waters the other fish which we classify as food fish.

The State has passed laws which impose penalties upon those who use destructive devices for the taking of fish, or who take fish before they have reached the age that they can reproduce themselves, or during the season when the breeding fish should be protected, and still heavier fines imposed upon that person or corporation who turns refuse into the water and poisons it so that the fish cannot live in it.

As the angler seats himself by the banks of the stream or wades out into the current, there comes an awakening and it is hugely jarred into his mind that there is no such thing as perpetual motion, and if he wishes the wheels of the Government to keep turning and turning smoothly, he must at times apply his own shoulder to the wheel to assist the officers entrusted with the enforcement of the law.

Much time and thought has been devoted by the Legislatures in the past half century of this Commonwealth and other States in making laws which would restore the streams to their original purity, prevent the wasteful and destructive devices from being used, and at the same time establish plants where fish can be raised artificially and used to restock the depleted streams. Yet the man who is fishing

has found himself, as said above, face to face with the fact that the laws do not enforce themselves, but can only be enforced by the consent and help of every citizen who believes that these laws are justified.

The common law which is the basis of our laws is merely crystallized common sense, evolved from the necessity and demands of the people for protection in property and personal rights. After this there have grown up statutory laws which are enactments of the representatives of the people called for by the force of circumstances and new conditions that constantly spring up. New laws are generally formulated by new interests that arise, and in most cases their proper enforcement demands that the public be taught their reason why and the benefit from their enforcement. This is largely true in the case of the laws governing the fishing which involve the protection of the fish and the clarification of the streams and the restocking of the same by artificial methods. As the population grew and the number of fishermen increased it became necessary that the rights of the people in the fish should be guarded by law in the same manner as the rights of the people in property are guarded. It is a self evident proposition to people who look into the matter that fish should not be taken during the spawning season and while the fish are on the nest, or else there will be no supply of young fish to grow up and take the place of the larger ones which furnish the sport and food.

No person in his sane senses would take the setting hen from her nest to furnish a meal for the suddenly arriving guest, and the same should be true in regard to taking a fish which is on her eggs. The farmer who kills all his chickens before they reach the egg laying period will in a short time have no eggs, and the same is true of the persons who take the small fish before they reach the size and age when they can reproduce themselves. It is not necessary to use a destructive device whereby the man who wants a few large fish destroys hundreds or even thousands of little fish to attain his desire.

It is to prevent such wasteful destruction that the laws were formulated and this Department is sure that if the people can be educated to understand the reasons for these laws, as set out above, there will be as common an assent to their enforcement as there is to the enforcement of the laws protecting people in their rights of property.

The fish of the State are the property of the Commonwealth and are for the use and benefit of the whole people, not only as a very important food supply, but as a means of sport and recreation. The importance of laws protecting fish from wasteful methods of fishing are not new, as we find them to have been enacted in England as far back as the 12th century. Having taught the people the importance of the laws protecting the fish so that they will propagate and multiply, it will be an easy matter to create an aroused sentiment of the absolute importance of keeping the waters of the Commonwealth pure and undefiled so that the fish may live and thrive therein. In fact public sentiment is aroused to such an extent at this present time that the Department is receiving complaints daily with reference to the pollution of some streams.

I have given this question of pollution of the streams much thought and the Department now has a plan of filtering refuse from the

various manufacturing establishments throughout the Commonwealth which it will recommend and which it knows from practical demonstrations will absolutely prevent refuse from getting into the streams and which can be installed at a very moderate cost to the manufacturer or mine owner. I have had this filter system patented, paying for the same out of my own personal funds, and will turn the patent rights over to the Commonwealth of Pennsylvania insofar as the Commonwealth is concerned. This system of filtration is the fruits of much thought and time given to it by one of the wardens of the Department, Mr. Albert, and myself and we know that it will do the work. The Department will be pleased and intends to furnish blue prints of this system to every manufacturer in this State and it will go a little further and will insist upon it being installed as it has so much confidence in its practicability that it does not hesitate to recommend its installation. This system of filtration will take care of and purify refuse from tanneries, dye works, chemical mills, oil refineries, mines, nitro glycerine works and creameries. The Department has on file in its office scores of letters from manufacturers in this State who are only waiting for the blue prints so that they can go ahead and install this system. The Department has found that the manufacturers as a whole are willing to co-operate with the Department in its work, which is very gratifying and now since it has something which it can stand back of it expects to accomplish much along this line of work. It is the biggest and most serious question the Department of Fisheries of Pennsylvania has to contend with today and with the hearty co-operation of all present here this afternoon and the co-operation of all those who are interested in the preservation of our fish life in our streams, the Department expects to restore the streams to their former pure state so that there will be good fishing for all.

The superintendent of one of the largest manufacturing establishments in the State, whose establishment is situated on one of the most polluted streams in the State, said they could at less cost purify the pollution running from their manufactory than it now costs them to purify the water they have taken from the river to use in their plants, because they know every constituent that goes into their operations and they know exactly what would neutralize it. This is only cited to show the extent to which pollution of the streams is carried on throughout the Commonwealth and what conditions the Department has to remedy.

The processes of the law are necessarily slow and the Department has no desire to needlessly hamper the manufacturers who show an earnest effort and willingness to improve conditions. The general public, however, does not understand this slowness of improvement, and in many cases have criticised the Department where criticism was not deserved. They cannot understand why where a river is full of dead fish it is not sufficient evidence to convict somebody of violating the law. Yet of these complaints the Department has never been able to obtain any witnesses who could testify absolutely as to the cause of the death of the fish. When they stand before the court their evidence is ruled out as having no weight whatever.

The Department of Fisheries is very much in earnest in its efforts to bring about the clarification of the streams, because its success in restocking the streams and waters depends almost entirely upon the

fact that those waters will sustain fish life, not destroy it. I sincerely hope that the streams of our Commonwealth, and we have the most beautiful in the United States, will in the very near future run free of pollution and deleterious matter so that they will teem with fish and fish life. I, as Commissioner of Fisheries assure you that the Pennsylvania Department of Fisheries is giving this question of pollution its most serious consideration and is now working out a plan whereby this might be accomplished and it will be accomplished if all present here this afternoon will lend their aid and co-operation.

In order to interest the growing generation in the protection and preserving of fish life the Department has had prepared a bronze cabinet, known as Bulletin Number 9, in which it has placed a number of vials containing some phase of the growth of the fish from the time that it is in the embryo in the egg until it has started in the race for life. The specimens are taken in one case, from the trout as the representative of the game fishes of the Commonwealth and in the other instance from the white fish as the representative of the commercial fish.

There is nothing more important in the eye of the Department than the enlisting of the rising generation as the friends of the fish. If the boys and girls of the Commonwealth can be shown how the fish lives, its habits, its instincts, and all the various phases of its life, the child will become interested and incited by that interest will be impelled to follow its study as he grows older and the more thoroughly he acquires an interest in the mysteries, for they are mysteries, of the lives of the dwellers in the water, the more he will become convinced that the requirements of the law which have been enacted to throw around the fish to safeguard them are necessary for its protection in these days of constant growth in population. Describing the cabinet a bulletin has been issued which tells of the characteristics of the fish, wherein they differ, and tells of the growth of the embryo to maturity.

To the person who knows nothing of fish life and its habits, the fish represents only so much of a portion of man's food. But to one who studies the life of the fish and its habits there is opened a volume as interesting as any upon the book shelves of the library and he finds treasures for thought like the man who found "Sermons in stones and books in running brooks."

The Department has had prepared a bulletin which treats of the capabilities of an acre of water in raising fish and is pleased to say that this bulletin is one of the most popular ones compiled by the Department. The co-operation of the farmers is needed by the Department, because if the farmers will take up the culture of fish they will be able to add largely to the food supply of the people, which in these days of high living is very essential. It has been said that it is not the "high cost of living" but the "cost of high living," which keeps the prices of commodities up, but I will let that for you to decide.

It was with much pleasure that I accepted the invitation to speak here this afternoon and I sincerely trust that this Conference will bring, not only the Departments in closer touch with each other, but the public as well, as without the hearty co-operation of the public much will be left undone which might otherwise be accomplished.

Let us, as a part of the Government of this Great Commonwealth, of which we all ought to be proud, pull together with: Efficiency, Economy and Co-operation in State work and with the general public in view.

I thank you for your attention.

On the third day of the Conference, Nicholas M. Edwards, Esq., Attorney at Law, Williamsport, Penna., delivered an address on stream pollution and the Department expresses herewith its appreciation of Mr. Edwards' kindness and co-operation during the Conference. Mr. Edwards' address follows:

"Mr. Chairman:—The subject of stream pollution has more prominently attracted the attention of the law making power of the Commonwealth within the last ten years than in all her previous history. Pennsylvania is now making an earnest and persistent effort to preserve the purity of her waters and more is now being accomplished in this direction than the general public fully appreciate.

The State is mainly doing this work through two of her Departments, viz: the Department of Health and the Department of Fisheries. The former having its prime object the protection of the public health, the latter, the preservation of fish life. The Department of Health was created in its present form by the Act of April 22, 1905, the Department of Fisheries by the Act of April 2, 1903. The executive head of the Department of Health is the "Commissioner of Health," while that of the Department of Fisheries is the "Commissioner of Fisheries." The Act of April 22, 1905, entitled an act "To preserve the purity of the waters of the State for the protection of the public health," provides among other things as follows: Section 4. No person, corporation or municipality, shall place or permit to be placed, or discharge or permit to flow into any of the waters of the State, any sewage, except as hereinafter provided. But this act shall not apply to waters pumped or flowing from coal mines or tanneries, nor prevent the discharge of sewage from any public sewer system, owned and maintained by a municipality, provided such sewer system was in operation and was discharging sewage into any of the waters of the State at the time of the passage of this act. But this exception shall not permit the discharge of sewage from a sewer system which shall be extended subsequent to the passage of this act. Section 8 provides: "All individuals, private corporations, and companies that at the time of the passage of this act are discharging sewage into any of the waters of the State, may continue to discharge such sewage, unless in the opinion of the Commissioner of Health, the discharge of such sewage may become injurious to the public health. If at any time the Commissioner of Health considers that the discharge of such sewage into any of the waters of the State may become injurious to the public health, he may order the discharge of such sewage discontinued." The penalty for the violation of this act by a municipality is \$500.00 and \$50.00 per day for each day the offence is maintained. The violation of the act by an individual or private corporation or company is made a misdemeanor and the penalty is fine and imprisonment or either.

The Act of June 27, 1913, "An act to preserve the purity of the waters of the State for the protection of public health and property"

provides as follows: "That from and after the passage of this act it shall be unlawful for any person, partnership or corporation to place or discharge or permit to be placed or discharged in or into any of the running streams of this State, any anthracite coal, anthracite culm or refuse from anthracite coal mine, or to deposit any such coal or culm, or refuse upon the banks of such streams, where the same would be likely to slide into or be washed into such stream. Provided, however, That this act shall not apply to the waters pumped or flowing from coal mines where the coal or culm, or refuse have been removed therefrom; or shall not prevent the discharge of sewage from any public sewer system, owned or maintained by any municipality in the Commonwealth." The violation of this act is made a misdemeanor. It is made the duty of the Commissioner of Health to enforce the above two acts.

Section 16 of the Act of May 1, 1909, relating to the Department of Fisheries, provides as follows: "That it shall be unlawful for any person to put or place in any waters within the Commonwealth, any electricity, or any explosive or poisonous substances whatsoever, or any drug or any poison bait, for the purpose of catching, taking, killing or injuring fish, or to allow any dye stuff, coal or gas tar, coal oil, saw dust, tan bark, coculus indicus, (otherwise known as fish berries), lime, vitriol, or any of the compounds, or any deleterious, destructive or poisonous substances of any kind or character to be turned into or allowed to run, flow, wash or be emptied into, any of the waters aforesaid, unless it is shown to the satisfaction of the Commissioner of Fisheries or the Court that every reasonable and practicable means have been used to prevent the pollution of waters in question by the escape of deleterious substances. In the case of the pollution of waters by substances known to be injurious to fishes or to fish food, it shall not be necessary to prove that such substances have actually caused the death of any particular fish." * * * * The penalty for the violation of this Section is \$100.00 and is enforced under Section 27 of said Act by summary proceedings before a Justice of the Peace or Alderman, with a right of appeal to the defendant in case of conviction, to the Court of Common Pleas. The responsibility for the enforcement of the provisions of this Act is upon the Commissioner of Fisheries.

It will be observed from the above citations from our statutory laws that the Commonwealth is fully awake on the question of stream pollution within her boundaries and is endeavoring through the above named Departments to correct the evil. These two Departments have been and are to-day confronted with the correction of an evil in the way of stream pollution which has been the result of a gradual growth in the development in the State's industrial life of more than a century. To correct this evil and at the same time to injure as little as possible legitimate industry is the problem now calling for solution by these Departments. The enforcement of these laws by the heads of these Departments should be, and as far as my observation goes, has been guided and measured by common sense, good judgment and tact. A wise man invested with great authority always uses it judiciously.

Pennsylvania has been blessed by nature with more beautiful streams than any State in the Union, and at the same time by reason of the great variety and volume of her manufacturing industries,

mining operations and growth of her cities and boroughs, has more to pollute the waters of these streams than any other State. How to prevent the pollution of the former and at the same time preserve the latter, has been and is to-day the practical question confronting these two Departments and requires through the Commissioner of Health and the Commissioner of Fisheries, the constant exercise of great fairness, persistency of effort and good judgment.

It will be noticed the Act of May 1, 1909, Section 16 above quoted forbids the pollution therein mentioned, "unless it is shown to the satisfaction of the Commissioner of Fisheries, or the Court, that every reasonable and practicable means have been used to prevent the pollution of the waters in question." * * * * Upon almost every stream of considerable size in Pennsylvania, there were at the time of the passage of the above laws and are to-day, industries of various kinds, such as tanneries, acid plants, paper mills, dye works, glue works, chemical plants, iron and steel works and many others, too numerous to mention, all discharging their pollution into the streams upon whose banks they are situated. These industries have been so located, upon the assumption that they had the right to discharge their refuse into these streams. The responsibility is upon the Commissioner of Fisheries, if he finds upon investigation that Section 16 of said act has been violated, to prosecute, if he is not satisfied "every reasonable and practicable means have been used to prevent pollution." This raises the question that has vexed very much the Department of Fisheries, as to what is a "reasonable and practicable means," which, when employed by the owners of these plants, will prevent pollution. Down to the present time this question has been passing through an experimental stage. Different plants, under the supervision of the Department have been trying out different methods to purify and clarify their refuse and pollution. There has been shown a commendable spirit on the part of most of the owners of these plants to comply with the law so far as they know how. Much progress has been made along this line and the condition generally has been much improved, as the result of the good work of both the Department of Health and the Department of Fisheries, though I speak on this point from knowledge of the work accomplished by the Department of Fisheries, which Department I have had the honor to represent in the Valley of the West Branch of the Susquehanna. It is safe to conclude that where it comes to a question as to which life shall be preserved, that of the fish or of the main industry of a community, the Court will find some means of preserving the industry. Hence the importance of good judgment and tact on the part of the heads of these Departments in the bringing of prosecutions. A criminal prosecution should be the last resort. Much more as a rule can be accomplished and has been accomplished by a wise and tactful handling of each case according to the special circumstances surrounding the same. To my knowledge, much effort and money have been expended by many of the industries in the West Branch Valley to purify the discharge from their plants, and to comply with the law in this respect. All of this has been due to the persistent effort on the part of the Commissioner of Fisheries to enforce the law against stream pollution. I wish here and now to make mention of the very efficient manner in which the present Commissioner of Fisheries is now conducting the business of his Depart-

ment and the earnest effort he has put forth to discover some practical means or process he could recommend to the owners of the different industries who have been polluting our streams.

I am authorized by him to say, that he has, after much experimentation, solved this difficult problem and that he has invented a process and means for purifying and clarifying the discharge from these different plants, which he is now having patented, and that the patent will be assigned by him to the Commonwealth. If this process meets with the expectation of the Commissioner, he will then be in position to inform the owner of the plant polluting the stream, what to do to prevent it, and neglect or refusal of the owner so to do, will fully justify the Department in the rigorous enforcement of the law against such offender. To require of the owner of a plant polluting the stream to stop the pollution and obey the law and at the same time being unable to inform him by what process the pollution can be corrected, has been one of the very embarrassing situations in which the Commissioner of Fisheries has been placed down to the present time. "Tell me what to do to prevent pollution" has been the reply of the owner of these plants in many cases to the Commissioner of Fisheries, when ordered by him to comply with the law. If the discovered process above mentioned fulfills expectations, it will mark a long step forward in the work in this State for the prevention of stream pollution.

Pennsylvania is not only the richest in natural wealth, but she is the prettiest of all the daughters of this great Union, and one of the most marked features of her beauty is the clear and limpid waters of her beautiful streams, as they flow from their common source, the mountain spring on their journey to the sea. Pennsylvania is the Switzerland of the United States, except that she is more beautiful than that play ground of Europe. Her scenic beauty is comprised of a landscape of mountain, hill and vale, forest, rock and stream, all so exquisitely blended as to form a picture of most enchanting beauty. Her face is one of her fortunes, and she will fully realize this when good roads connect her boarders with that of her sister States.

The hope and fixed purpose of these two Departments is to eventually redeem the waters of our State from pollution of every kind and give back to her people these streams in all their pristine beauty and purity. To this end they should have the hearty co-operation of every good citizen.

OFFICE OF THE ATTORNEY GENERAL.

Harrisburg, Pa., December 14, 1915.

Hon. N. R. Buller,
Commissioner of Fisheries,
Harrisburg, Pa.

Sir:—This Department is in receipt of your inquiry of November 29, 1915. In this you state that certain defendants in Wayne County were arrested on an Information drawn under the Act of May 5, 1909, P. L. 408; after a summary hearing they were found guilty and sentenced. Thereafter, on habeas corpus proceedings, they were released in that the prosecution should have been instituted under the Act of May 22, 1889, P. L. 1. In other words, the facts, if fully developed at the hearing, were not sufficient to sustain a conviction under the Act, with the violation of which the defendants were charged.

You ask if after a judgment in a summary proceeding a defendant is discharged on appeal or by writ of habeas corpus, whether he may again be arrested and summarily tried upon the same facts.

Where, in a summary proceeding, a defendant is convicted and thereafter the conviction is reversed, the matter presented involves either—first, the jurisdiction; second, the procedure; or third, the substance of the prosecution.

The doctrine of former jeopardy is often improperly applied to such actions. Former jeopardy is only applicable to felonies, and in this State is strictly applied only to crimes the punishment of which is capital. By analogy, however, the Courts uniformly extend the general principles of former jeopardy to all criminal and penal actions under which the defendant might be sentenced to imprisonment, if convicted. There are no well marked rules for applying the doctrine so adopted. In order, therefore, to properly inform you it is necessary to cite cases under which the plea of former acquittal or conviction has been held to be inapplicable.

Summary convictions are principally distinguished from the ordinary criminal action in that the former are triable by a Justice of the Peace or other proper official on an information made by the prosecutor, while the latter are triable before a Court and Jury of twelve upon an Indictment found by a Grand Jury.

While there is a marked paucity of decisions or other authority on the effect of former acquittal or conviction in summary proceedings, yet the decisions bearing on such a plea in the trial of misdemeanors may be readily applied to summary convictions by likening the Indictment in the former to the Information in the latter.

As stated in 12 Cyc. 278:

"The accused is estopped to plead a prior conviction where his conviction has been reversed for error on an appeal or writ of error brought by himself, although he has served a part of his term in imprisonment."

This rule was followed in the case of *Pennsylvania vs. Huffman*, Addison 140. In this case the defendant was charged in the Indictment with having forged a receipt, for the use of "Hugh Brison" on the trial of the case the receipt offered in evidence showed the man's name to be "Hugh Prison," but on motion the judgment was arrested. Thereafter a new Indictment was returned, in which the name was properly spelled. The Defendant plead former conviction. The Court in over-ruling the plea stated:

"On the merits, Huffman has been convicted of forgery, though not of the forgery stated in the indictment and verdict, no judgment could be given because the verdict did not find the offense laid in the indictment; and because that indictment for forging the note stated in it, could be no bar to another indictment, for forging the note given in evidence. The error is apparent on the record. And to say now, that this is an indictment for the same offense would be, in fact, saying, that we ought to have given judgment on the former indictment."

This case is referred to in *Sadler on Criminal Procedure in Pennsylvania*, page 336, in which the rule is stated:

"The former conviction must have been upon an indictment sufficient to sustain the judgment."

In the case of *Commonwealth vs. Zepp*, 3 Clark, 255, a defendant was tried on an Indictment charging him with violation, in 1840, of an Act which was not passed until 1842, and Defendant was acquitted. Thereafter a new indictment was returned giving the correct date of the offense as 1845. The Defendant's plea of former acquittal was over-ruled for the reason that the first Indictment was not sufficient to have sustained a conviction.

In the case of *Commonwealth vs. Allen*, 24 Pa. C. C. Rept. 65, it was held that where a defendant is discharged on an insufficient indictment the law has not had its end, and that he may again be indicted and tried.

Again in the case of *Commonwealth vs. Eagles*, Et Al. 7 A. N. C. 324, it was held:

"To support the plea of *autrefois acquit*, in an indictment for larceny, the defendant must show affirmatively that in the former trial his liberty was in legal jeopardy. If it appear that the Court had no jurisdiction; or that there was clear error, which would necessarily have required a reversal of the sentence on a writ of error; or that an Act of Assembly under which the defendant was tried was clearly and palpably unconstitutional, the plea of former trial and acquittal is not maintainable in bar of a second indictment in the Quarter Sessions for the same offense."

In considering the last excerpt, however, it must be borne in mind that any error which would justify a re-trial after acquittal, must be more than an error of procedure. If the Justice had jurisdiction and the information was directed to the proper Act of Assembly and sufficient to sustain a conviction, re-arrest and trial after acquittal would be only justified by the clearest error or fraud and collusion in the prosecution.

In the case which you present, I would advise that the defendants may be re-arrested under an Information charging them with the violation of the proper Act. It would be well if you would call to the attention of this Department the particulars in each case in which a re-arrest and re-trial is thought necessary, but for your general guidance in this matter would advise that in summary proceedings where the defendant is convicted and prior to having served his sentence the sentence is reversed, or the defendant discharged on habeas corpus, he may be re-arrested and re-tried where

1. The Justice or other trial officer had no jurisdiction.
2. The Information was not sufficient to sustain a conviction.
3. Such reversal or discharge was occasioned by improper procedure such as an insufficient record or transcript, &c.

The first and second reasons are also sufficient to justify a re-arrest and re-trial of the defendant even where the defendant on the hearing was acquitted.

Where an Information is sufficient, and the procedure otherwise correct, the record or transcript may in most instances be amended as to formal defects.

Very truly yours,

(Signed) HORACE W. DAVIS,
Deputy Attorney General.

OPINION OF THE COURT.

COMMONWEALTH

vs.

ARCHIBALD MILLER.

} In the Court of Quarter Sessions
of Somerset County, Pennsylvania.
No. 45 December Sessions, 1914.

An information was made against the defendant charging him with polluting a stream under the sixteenth section of the Act of First May 1909, P. L. 353. Several witnesses were called before the Justice of the Peace on behalf of the Commonwealth, but no evidence was submitted by the defendant, and the Justice found the defendant guilty and imposed a fine of one hundred dollars and costs. From this conviction and sentence an appeal was taken to the court of quarter sessions, and the case was tried without a jury. A large number of witnesses were heard on part of the Commonwealth and also on behalf of the defendant. The undisputed facts are: That Dark Shade creek in Shade township, Somerset county, was inhabited by fish prior to the year 1914, and that trout, catfish and other varieties were frequently caught in the stream from McGregor's Dam down to its confluence with Clear Shade, some miles below; that in the year 1912, the Loyalhanna Coal & Coke Company opened mines and

commenced the mining and removal of coal from the B or Miller seam, at a point almost opposite McGregor's Dam, and the drainage from this, which was a drift mine, flowed into the Shade creek just below the McGregor Dam. Joseph Patterson has been the superintendent of the coal company since it commenced its operation in this field, and a Mr. Severn was his assistant and on the ground during the whole of the time until the summer of 1914. On the 17th of August 1914, the defendant, Archibald Miller, succeeded Mr. Severn as assistant superintendent and has had charge of the works and mines since that time. On the 18th day of August, 1914, the next day after Mr. Miller took charge of the mines, Mr. McIntosh, the prosecutor in this case, as a representative of the Department of Fisheries, made an examination of the waters of Shade creek and of those flowing from the mine of the Loyalhanna Coal and Coke Company at the McGregor Dam, and claimed that the drainage from this mine which flowed into the creek contained acid and was deleterious and destructive of fish life. The testimony as to the existence of fish in the stream during 1914 is very contradictory. The witnesses for the Commonwealth testified that no fish could be found in the stream, while several witnesses on part of the defendant testified that fish were caught during the season of 1914. One witness stating he had caught between 300 and 400, and all of them taken from the point in the creek claimed to have been affected by the water discharged from the mine of the Loyalhanna Coal and Coke Company.

At the threshold of the case defendant objected to the introduction of testimony because the information does not state such facts as to give the Justice of the Peace jurisdiction, and if the Justice of the Peace had no jurisdiction the court has none upon appeal. The failure in the information to allege that Shade creek was a stream inhabited by fish or fish food, it is argued, leaves the charge incomplete, and consequently did not confer upon the Justice Jurisdiction to take cognizance of the case. When a case is brought into the Court of Common Pleas by certiorari to the Justice of the Peace, then the record must show everything necessary to sustain a conviction including the evidence, judgment of the justice, &c. But when the case is brought by appeal into the quarter sessions, many omissions and irregularities in the proceedings before the justice are waived. But not so as to the matters contained in the complaint. The complaint before the justice takes the place of an indictment in the trial by jury, and everything that is essential to be set forth in an indictment must necessarily be contained in the information. The information is brought up and the court is bound by this just as much as a court and jury would be by the information or indictment in the trial of a case in the quarter sessions before a jury. Therefore, if the information is fatally defective the justice was without jurisdiction and the court is likewise without jurisdiction.

"It was therefore necessary to the jurisdiction of the magistrate and the validity of his warrant that the complaint should distinctly state that the work mentioned in it was performed on Sunday. It is not sufficient in such case that it may appear from the evidence on the trial or by reference to the almanac that it was so performed. The complaint is the foundation of the proceeding and the jurisdictional facts must appear on its face by a plain statement of them. Neither the warrant nor the docket entries can supply them

or dispense with their presence there. It is claimed by the Commonwealth's counsel that this view of the subject is purely technical, but we cannot so regard it. The defect complained of is substantial and jurisdictional. A light defect in an indictment is ground for a resting judgment upon it, and it seems reasonable that such a defect in the complaint which is the basis of a summary proceeding should vitiate the latter." *Commonwealth v. Gelbert*, 170 Pa., 426.

"The defect in this case is of the same nature as the defect in that, (*Commonwealth v. Gelbert*, *Supra*) and it consists of the omission from the complaint of a jurisdictional fact. The written complaint in this case fails to show that the acts mentioned in it were committed in Lackawanna county." *Commonwealth v. Phelps*, i. d. 430.

"The information upon which the proceeding before the justice of the peace was founded ought to have set forth every material element of the offense, and facts necessary to establish the jurisdiction of the justice." *Commonwealth v. Ayers*, 17 Pa. Sup. Ct. 352.

This question is fairly ruled by Judge Audenride of Philadelphia in *Commonwealth v. Lianaugh*, 30 Pa. C. C. Rep. 466, which like the present case was an appeal from a conviction by a magistrate; and in the opinion Judge Audenride says:

"If this case had been taken on certiorari before the Court of Common Pleas, it is clear that the judgment of the magistrate would be reversed on grounds purely technical. * * * *"

If the affidavit of George Vail, on which the warrant for the defendant's arrest was issued, failed to contain a direct and positive charge against the defendant, with a complete statement of the offense showing distinctly that the work mentioned in it was performed on Sunday and in the County of Philadelphia, the prosecution would fail. * * * *

With the defects in the proceeding before the magistrate, if, by reason of a proper complaint made before him and due service of the warrant issued, thereon, he acquired jurisdiction of the case, this court is not concerned on appeal. The appeal brings the case before the Court of Quarter Sessions for retrial. Everything is to be gone into de novo. The matter is to be handled and disposed of just as if the prosecution had been begun here. But if a properly stated complaint, fulfilling the requirements of law as to precision and particularity, is required to give the magistrate jurisdiction of the case originally, it is just as necessary as the basis for the proceedings in this court. A defect in the complaint in such a point as that referred to in *Com. v. Gelbert*, or as that mentioned in *Com. v. Phelps*, (*Supra*), is fatal and vitiates the whole proceeding."

In *Commonwealth v. Simpson*, 33 Pa. C. C. Rep. 188, which is an appeal from a summary conviction, Judge Thomas says:

"It is true the court might look into the record to see if the magistrate had jurisdiction of the offense charged upon appeal, and upon a showing of lack of jurisdiction might quash the proceedings, but we are not persuaded that the record shows a lack of jurisdiction."

"The jurisdiction of the quarter session is not original nor concurrent, but appellate." *Commonwealth v. Ruth*, 34 Pa. C. C. Rep. 650.

In *Commonwealth v. Blair*, 17 Pa. D. R. 656, in an appeal from a summary conviction, Judge Sadler expresses his views as follows:

"It being, however, apparent to us, irrespective of the matters raised by the exceptions, that the justice was without jurisdiction to hear and dispose of the case outside of the limits of the Borough of Mechanicsburg, the defendant ought not to be longer harassed and subjected to the expense of further proceedings."

The judgment entered by him in the case was a nullity. * * * *

"Besides, if the justice did not have jurisdiction, the court will not have jurisdiction on the appeal."

Is the information in this case defective? It charges that the defendant, "did then and there unlawfully turn into and allow to run, flow or be emptied into the waters of Shade creek, a large creek flowing in said township by said village, mine water and drainage from the mine of said Loyalhanna Coal & Coke Company, which said mine water is deleterious, destructive and poisonous substance containing acid, sulphates of lime and magnesia, and sulphate of iron, which said acid water is deleterious, destructive and poisonous to fish and aquatic life, and by the said turning into and allowing said drainage and mine water to run, flow or be emptied into said stream violated the provisions of Section 16 of the Act of May 1, 1909, P. L. 353, which section reads as follows: (Quoting the section) All of which the affiant verily believes, and further deponent saith not."

There is no allegation here that the waters of Shade Creek contained either fish or fish food. That this was believed to be a material fact by counsel for the Commonwealth was demonstrated by the calling of a number of witnesses to prove that for many years prior to 1914, Shade Creek was known to be inhabited by fish of various kinds.

The Act of Assembly, as indicated in the preamble is "to classify the fish in the waters within this Commonwealth, * * * to protect the waters, * * * from unfair, improper, wasteful, and destructive fishing, and to protect fish from being destroyed or injured by destructive means." &c.

The 16th Section under which this prosecution is founded, provides:

"That it shall be unlawful for any person to put or place in any waters within the Commonwealth, any electricity, or any explosive or poisonous substances whatsoever, or any drug, or any poison bait, for the purpose of catching, taking, killing or injuring fish; or to allow any dye stuff, coal or gas tar, coal oil, sawdust, tan bark, cocculus indicus, (otherwise known as fish berries), lime, vitrol, or any of the compounds thereof, refuse from gas houses, oil tanks, pipes, or vessels, or any deleterious, destructive or poisonous substances of any kind or character to be turned into, or allowed to run, flow, wash or be emptied into, any of the waters aforesaid, unless it is shown to the satisfaction of the Commissioner of Fisheries, or the court, that every reasonable and practicable means have been used to prevent the pollution of waters in question by the escape of deleterious substances. In the case of the pollution of waters by substances known to be injurious to fishes or fish food, it shall not be necessary

to prove that such substances have actually caused the death of any particular fish." &c.

It is manifest from both the preamble to the act and the language of this section, that the purpose of the Legislature was to protect fish. The act is not directed in any way toward the use or abuse of streams which are used purely for domestic, agricultural or mechanical purposes, but the Legislature had in view only such streams as were the habitat of fish. It therefore becomes necessary in order to sustain the prosecution under this section of the act to allege and prove that the stream was inhabited by fish at the time of the commission of the act complained. There being no such allegation in the complaint in this case, the prosecution must fall.

We might rest the case here, but as this would be disposing of the case on somewhat technical grounds, we prefer going a little further. Do the facts alleged bring the case within the provisions of the Act of 1909? Nothing is said in the act about the discharge of waters from coal mines, and it is reasonable to suppose that if the Legislature intended to place an inhibition upon the operation of mines by such drastic means as are invoked in this case, it would have said so in plain and unmistakable language. The statute is penal. It cannot be extended constructively to cover more than is expressly specified in the language of the act. That the Legislature has power to enact laws for the preservation of fish is without question.

"The duty of preserving the fisheries of a State from extinction, by prohibiting methods of fishing, or the use of such destructive instruments as are likely to result in the extermination of the young as well as the mature fish, is as clear as its power to secure to its citizens, as far as possible, a supply of any other wholesome food." *Lawton v. Steele*, 152 U. S. Rep. 132. (Law E. D. 38, page 385).

But as is said by Mr. Chief Justice Fuller in a dissenting opinion in that case:

"The police power rests upon necessity and the right of self-protection, but private property cannot be arbitrarily invaded under the mere guise of police regulation, nor forfeited for the alleged violation of law by its owner, nor destroyed by way of penalty inflicted upon him, without opportunity to be heard." The dissenting opinion was concurred in by Justice Field and Justice Brewer, and the question involved merely the right to confiscate or destroy nets used contrary to an Act of Assembly.

As early as 1878 in the celebrated case of *Sanderson v. Pennsylvania Coal Company*, the Supreme Court of Pennsylvania in an opinion delivered by Mr. Justice Woodward, uses this language:

"The proprietors of large and useful interests should not be hampered or hindered for frivolous or trifling causes. For slight inconveniences or occasional annoyances they ought not to be held responsible, and dealing with such complaints juries should be held with a steady hand. Only when some material and appreciable injury has been sustained, should a recovery against them be allowed."

This language was used in a case involving private rights, damage claimed by one party for injury inflicted by another. In the case be-

fore us no such questions arise, but here is one purely of public concern; the matter of protecting fish in a stream, although this stream is upon private lands. There is no complaint by the owner of the lands or the streams; the complaint comes from an officer of a Department of the State erected for the protection of the different species of fish. If it had been the purpose of the Legislature to strike a blow at the mining industry of the State, such as a conviction in a case of this kind would be, it ought to have declared its intention in unmistakable language. To sustain a conviction of this kind would result in closing many of the coal mines in Somerset county and elsewhere, unless the theory set up by the Commonwealth be established, that neutralization could be effected by some practical method. Before effect can be given to the act of assembly producing such results, there ought to be the clearest manifestation of the intention of the Legislature of such a result.

Counsel for defendant referred to the Act of 27th, June, 1913, P. L. 640, as convincing proof that the Legislature did not intend to include in the prohibitions of the Act of 1909 the water flowing from ordinary drift mines. The first section of the act of 1913, makes it unlawful to place in any of the running streams of the State any anthracite coal, culm or refuse from anthracite mines, but this section has this proviso:

"That this act shall not apply to waters pumped or flowing from coal mines where the coal or culm, or refuse have been removed therefrom."

I am of opinion therefore, that no conviction could be had under the Act of 1909.

Then again, looking at the facts in the case, we are confronted with serious contradictions and doubtful conclusions. On part of the Commonwealth a number of witnesses were called to establish the fact that by reasons of the flow of the drainage from this mine the fish in the stream below the point of its entry into Shade creek had become so polluted that the fish as well as the fish food, were all destroyed. Whereas, quite a number of witnesses called by the defendant show conclusively that fish did exist in the stream during the fishing season of 1914 and that many fish were caught during that season.

Again, the water produced by the witnesses for the Commonwealth as samples taken from the flow from the mine, were proved by the chemists introduced by the Commonwealth to be acid deleterious and destructive to fish life. On the other hand, samples of water from the same stream produced by the witnesses for the defendant were shown to be alkaline, free from deleterious substances, and not at all destructive of fish. The evidence on this branch of the case at the first hearing on March 8th, 1915, was so contradictory and so absolutely inconsistent that one of the witnesses, a chemist called on behalf of the Commonwealth, when asked by the court for an explanation of this difference said, he could only account for it by the fact that the results were obtained from different waters and not from the same samples of water. But all was cleared up so far as the evident contradictions were concerned by the testimony of all the witnesses at the hearing on the 19th, of the same month, when it was shown

that the water produced by the Commonwealth must have been caused by some substance which entered the stream as it passed through the tile drain. It was shown that before the mines were in operation at that point there were springs and a sort of swampy place through which the tile drainage was afterwards laid; and the only reasonable inference from the facts developed is that from a source not disclosed in the testimony came the acidity which is complained of in this case. At any rate, the evidence on this one point is so contradictory, unsatisfactory and inconclusive that a conviction could not be permitted to stand thereon. Another serious question confronts us in the case, and that is the fact that this mine was open and in operation for two years before the defendant took charge of it. The prosecution against him was instituted almost immediately after he was appointed assistant superintendent of the works. There is no evidence to show that he by any act contributed in any manner to an increased flow of the water from this mine or made any changes either in the mining operations or the course of the stream by which he could be held criminally responsible for the result complained of in this prosecution. This being a criminal case the usual rules applicable to the trial of cases in the court of quarter sessions are to be applied here; and with the question of reasonable doubt involved were the trial being conducted before a jury, there can be no question but that the jury would acquit; in fact, under the evidence as it has been presented no court would permit a conviction to stand under the facts of the case.

As was said by Judge Weand in a similar case under the same Act of Assembly in *Commonwealth v. Crowther*, 13 Pa. J. L. R. 29:

"We are sitting as a jury bound by the same rules of law as if the case was before a jury, and we are convinced from the weakness of the Commonwealth's testimony and the strength of that of the defendant, that there is not only a reasonable doubt of the defendant's guilt, but positive evidence of his innocence."

See also *Commonwealth v. Lunt*, 1 d. 33.

At the trial the Commonwealth assumed the burden of proving that the defendant could have adopted measures to have rendered the waters, even though acid, neutral or alkaline. A number of witnesses were produced, many of them experts in their lines, who testified they believed that by the use of limestone or lime and certain appliances, models or diagrams of which they produced in court the escape of deleterious waters could have been prevented. No witness testified from actual knowledge or practical demonstration. On the other hand a great many witnesses from different coal companies and other operations testified that there was no particular method known by which the waters from such a mine as this, if acid, could be neutralized by any reactionary process without entailing such large expense as would necessarily close down the mining operation. Under this testimony the court would be constrained to find the defendant would escape conviction by reason of the proviso found in the 16th section of the Act of 1909: "Unless it is shown to the satisfaction of the Commissioner of Fisheries, or the court, that every reasonable

and practicable means have been used to prevent the pollution of waters in question by the escape of deleterious substances."

I am very clear that under all the evidence in this case can be no conviction, and therefore direct a verdict of not guilty, and the county to pay the costs.

By the Court,

RUPPEL.
President Judge.

HISTORICAL ACCOUNT OF ERIE COUNTY.

The Department gives herewith data bearing on the County of Erie and Presque Isle Peninsula, believing as it does, that the Port of Erie, which is located in Erie county, is of much value to the rest of the Commonwealth.

The old Erie canal which extended from Erie to Pittsburgh a number of years ago was a means of bringing into the interior of the State much skilled labor and it made Pennsylvania an "Iron Center," iron ore being transported through this canal, as this was the only means of transportation, except by "pack-horse." The Erie canal was surveyed in 1825 and completed in 1844. In 1822 the State made an appropriation of \$10,000 for the improvement of Erie Harbor. No other appropriation was made until \$150,000 was appropriated for a steel pier. The first appropriation made by the United States Government was in 1824, amounting to \$30,000.

Each inch of depth of Erie Harbor contains 90,000,000 gallons of water.

The following table shows a mean height of the lakes above sea level, bottom of lakes below sea level, and area of surface of the lakes:

Name of Lake.	Mean Height Above Sea Level.	Bottom of Lakes Below Sea Level.	Area of Surface.
Superior,	601.8	406 Feet.	31,200 Sq. Miles.
Huron,	581.3	168 Feet.	23,800 Sq. Miles.
Michigan,	581.3	288 Feet.	22,450 Sq. Miles.
Erie,	572.39	.....	9,969 Sq. Miles.
Ontario,	246.6	.....	7,210 Sq. Miles.

Erie, Pa., March 27, 1914.

Hon. N. R. Buller,
Harrisburg, Pa.

Dear Sir:—Your letter of March 26th to hand. The public wharf in the City of Erie was built from the proceeds of the sale of the land in the Third Section of the city in pursuance of an Act of Assembly.

The building of that wharf enclose, what was afterwards called, the canal basins and the act authorizing the laying out of water lots styled them "In shore lots and out shore lots." These lots were sold at public auction. The in-shore lots extend from the north side of Front street to the south side of the canal basin, and the out-shore lots extend from the north side of the canal basin to the north side of the public wharf. I can give you a reference to these lots. The act for the sale of the third section was passed April 8, 1833, P. L. 243. Afterwards the Legislature by Act of April 15, 1834, P. L. 520, Section 2, "until the Legislature shall otherwise provide the burgess and town council of said borough shall have power to enact ordinances for the preservation of the canal basins now being erected in the Bay of Presque Isle, etc."

The first section extended the boundary of the city northwardly thirteen hundred feet into the Bay of Presque Isle which included the north edge of the public wharf. The city exercises control over the canal basins and there is an ordinance prohibiting the placing of any permanent obstruction in the basins. The State has never parted with the title or the fee of these basins only delegated the control of them to the city. The Legislature could any time, by Act of Assembly, change the status of the control of the basins.

Trusting that I have answered your question satisfactory, I am

Very respectfully yours,

(Signed) CLARK OLDS.

An act to provide for selling the several reserved tracts of land adjoining the towns of Erie, Franklin, Warren and Waterford, and for other purposes therein mentioned.

Section 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same, That the Governor is hereby empowered to direct the Surveyor General to make, or cause to be made, actual surveys of the reserved tracts of land adjoining the towns of Erie, Franklin, Warren and Waterford, which have not been laid out in town or out lots, or ceded to the United States, and to lay off the same into lots, not exceeding one hundred and fifty acres in each, and marking the lines thereof, and designating first, second or third quality in said drafts: Provided always, That in each of the said reserved tracts the quantity of five hundred acres be laid off, for the use of such schools or academies

as may hereafter be established by law in the said several towns; which said several surveys shall be returned to the office of the Surveyor General, and general drafts thereof to the office of the Secretary of the Commonwealth.

Section 11. And be it enacted by the authority aforesaid, That the Governor, after the said actual surveys shall be made, and general drafts thereof lodged in the office of the said Secretary, be, and he is hereby authorized and required to transmit a copy of each draft to the commissioners to be appointed for the sale of the in and out lots in and adjoining the towns of Erie, Franklin, Warren and Waterford, as soon as conveniently may be, and it shall then be the duty of the said commissioners to give notice by advertisement, at least six weeks, in three of the public newspapers in the City of Philadelphia, in at least one one paper printed in Dauphin county, one in Pittsburgh, one in Lancaster, and one in Washington, of the time that the books will be open for the sale of all the reserved lands, laid out by virtue of this act, adjoining the above towns, on the following terms, to wit: one-fifth part of the purchase money shall be paid at the time of sale to the commissioner attending, one-fifth part to the Receiver General of the land office, within twelve months from the day of sale, one-fifth part within two years from the said day; and the remaining two-fifth parts in or before the expiration of three years after such sale; but that no contract shall be confirmed by said commissioner for fifteen days after the said books shall be opened, and the highest price offered within that time shall be accepted.

Section 111. And be it further enacted by the authority aforesaid, That it shall be the duty of the commissioner to enter the purchaser's name in his book, the number, quality and quantity of acres, date of entry, and amount of sale, a certified copy of which he is to give to the purchaser, which certificate shall be forwarded to the Secretary's office, within six months after the date thereof; but no sales shall take place at less than four dollars per acre for land of the first quality, three dollars per acre for land of the second quality, and two dollars per acre for land of the third quality: Provided always, That nothing herein contained shall be taken or construed to vest any right or title, in law or equity, in any person or persons purchasing as aforesaid, unless he, she or they shall, within three years after the date of their respective purchases, make an actual settlement thereon, by clearing, fencing and cultivating at least two acres for every fifty acres contained in one survey, and erect on each lot or tract a messuage for the habitation of man, and reside thereon for the space of five years following their first settlement of the same; and in default of such actual settlement, residence and improvement, the purchaser or purchasers shall forfeit all payments made to the Commonwealth, and the Governor is hereby authorized to direct that such forfeited lot or tract be sold at public sale, in the town near where such forfeited lot or tract may lay; and no patents shall issue for any lot or tract sold by virtue of this act, until satisfactory proof be made to the Governor of the Commonwealth of such actual settlement, residence and improvement having been made as aforesaid.

Section IV. And be it further enacted by the authority aforesaid, That the Governor be, and he is hereby authorized to appoint four commissioners, one of which shall reside in each town, whose duty it shall be, with the assistance of two reputable citizens, appointed by

the Judges of the Court of Common Pleas of the County of Allegheny, for each commissioner to appraise all the in and out lots in the towns of Franklin, Warren and Waterford, and the first section of Erie, and the out lots thereto adjoining, which appraisement shall be regularly entered in a book for that purpose. It shall then be the duty of the commissioners aforesaid to advertise the town and out lots for sale, on the following terms, to wit: the one-third part of the purchase money shall be paid at the time of sale to the commissioner attending, when the entry of sale is made, whose duty it shall be to certify the same; one-third part to the Receiver General of the land office, within twelve months from the day of sale; and the remaining one-third part within eighteen months from the day of sale; for the performance of which the purchasers, respectively, shall, at the time of sale, give bond for the payments of the said installments to the said commissioners; and at the expiration of eighteen months aforesaid, the Governor is hereby authorized to grant patents to the purchasers, provided the purchase money is paid according to the sales.

Section V. And be it further enacted by the authority aforesaid, That those persons who have purchased any lot or lots in the second and third divisions of the town of Erie, may take lot or lots in the first division of said town, at the same price they purchased them at the former sales, and that all those who have paid for or improved any forfeited lot or lots shall have a pre-emption to said lot or lots, at the prices they sold for at former sales; provided he, she or they apply within three months after the passing of this act, and pay for the same.

Section VI. And be it further enacted by the authority aforesaid, That the commissioner at the town of Erie shall offer at public sale the lot of ground reserved in said town, at the mouth of Cascade creek, including the same, after giving three months notice in three of the public newspapers of this State, of the time and place of such sale, on the same conditions specified in the third section of this act; provided the same amounts to fifty dollars per acre.

Section VII. And be it further enacted by the authority aforesaid, That the said commissioners, before they enter on the duties required by this act, shall give bond, with two good sureties, in a sum not less than five thousand dollars, to the Governor, each, conditioned for the true and faithful performance of their respective trusts, and shall receive three cents on every dollar received and contracted for, which shall be in full for their services, and the persons appointed by the court to assist each commissioner to appraise the town and out lots shall receive two dollars per day, which shall be in full for all their services.

Passed 11th April, 1799.

An act to provide for laying out and establishing towns and out lots within the several tracts of land heretofore reserved for public uses, situated respectively at Presque-Isle, on Lake Erie, at the mouth of French creek, at the mouth of Conewango creek, and at Fort le Boeuf.

In order to facilitate and promote the progress of settlements within this Commonwealth, and to afford additional security to the frontiers thereof, by the establishment of towns within the several tracts of land heretofore reserved for public uses:

Section I. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same, That the Governor may and shall appoint two commissioners to survey or cause to be surveyed, one thousand and six hundred acres of land for town lots, and three thousand and four hundred acres of land, adjoining thereto, for out lots, at or near to Presque Isle, on Lake Erie, within the tract heretofore reserved for public use in and by an act entitled "An act for the sale of the vacant lands within this Commonwealth," passed on the third day of April, in the year one thousand seven hundred and ninety-two; and the said lands so surveyed shall respectively be laid out into town lots and out lots, in such manner, and with such streets, not more than one hundred nor less than sixty feet wide, and such lanes, alleys and reservations for public uses, as the commissioners shall direct, but no town shall contain more than five acres, nor shall the reservations for public uses exceed in the whole twenty acres; and the town hereby directed to be laid out shall be called "Erie," and all the streets, lanes, and alleys thereof, and of the out lots thereto adjoining, shall be and forever remain common highways.

Section II. And be it further enacted by the authority aforesaid, That the said commissioners shall with all convenient despatch, file a draft, return and report of the survey and proceedings made and executed by virtue of this act, in the office of the Secretary of the Commonwealth, and thereupon it shall be lawful for the Governor, at such time and times, in such manner, and on such terms, as to him shall appear most advantageous to the Commonwealth, to sell, or cause to be sold, at public auction, and by letters patent under the seal of the State to grant and convey, to the highest and best bidders respectively, one-third part of the town lots and one-third part of the out lots surveyed and laid out as aforesaid, upon the condition hereinafter specified, that is to say; that the respective purchasers shall and do, within the term of two years from and after the day of sale, erect and build one house, at least sixteen feet square, and containing at least one brick or stone chimney, on each and every town lot by them respectively purchased; and the Governor shall not grant nor issue any patent, nor from and after the expiration of the said term of two years shall any sale, so made as aforesaid, be deemed or construed to vest in the respective purchasers any title, interest, claim or demand, in law or equity, to the lots by them respectively purchased, but all payments previously made shall thenceforth be forfeited to the Commonwealth, unless satisfactory proof be first given to the Court of Common Pleas of the proper county, and be

by such court certified to the Governor, that a house has been erected and built on the town lots respectively, for which patents shall from time to time be required, according to the true intent and meaning of this act: Provided always, That the Governor shall, at least eight weeks previously to the sale of the said town lots and out lots, or any of them, issue and publish or cause to be issued and published, in at least one newspaper in each of the counties in this Commonwealth, in which newspapers are printed, a notification of the time, place, terms and conditions of such sale: Provided also, That the Governor shall cause a draft or drafts of the said town and out lots to be exposed to view in some suitable public situation, in each of the places where such notifications shall be published, and also at the time and place when and where the said lots shall be exposed to sale: And provided further, That at the time of such sale, not more than one town lot and one out lot shall be put up to sale together.

Section III. And be it further enacted by the authority aforesaid, That one moiety or half part of the purchase money of each and every lot sold in the manner directed by this act shall be paid within three months from and after the time of such sale, and the other moiety or half part thereof within one year from the time of such sale, together with lawful interest for the same; and in case payment for any of the lots should not be made within the term or terms herein mentioned and fixed for payment, the sale of such lot or lots shall be absolutely void, and of no effect.

Section IV. And be it further enacted by the authority aforesaid, That the said commissioners shall also survey, or cause to be surveyed, previously to and exclusively of the survey of the said town lots and out lots, one lot of sixty acres, on the southern side of the harbour of Presqu' Isle, one moiety thereon upon the bank, and the other moiety below the bank, comprehending the point at the entrance of the harbour, one lot of thirty acres on the peninsula, at or near the entrance of the harbour, and one other lot on the peninsula, to contain one hundred acres, for the accommodation and use of the United States, in erecting and maintaining forts, magazines, arsenals and dock yards thereon, and in such other improvements as the said United States may judge proper to make, for their advantage and convenience; and the situations and forms of the said three lots shall be chosen and fixed, with a special reference to the uses aforesaid, by the said commissioners, and the engineer who shall be employed by the United States, if any such shall be appointed, and shall attend for that purpose; and the said commissioners shall, with all convenient despatch, return and file in the office of the Secretary of the Commonwealth, a draft of the location and survey of the said three last mentioned lots, and the said draft, being approved by the Governor, and recorded by the Secretary, shall be deposited in the office of the Surveyor General; and it shall be lawful for the United States at any time thereafter to take possession of, and occupy the said three last mentioned lots, and thereon to erect, establish and maintain all necessary forts, magazines, arsenals and dock yards and to make such other improvements thereon, as they may judge proper, and the same to continue to possess, occupy and hold, so long as they shall deem it expedient to maintain and shall actually maintain a fort, garrison, or other military establishment, at or near

Presqu' Isle, and no longer: Provided always, That if the mill-seats on the creek running near the ruins of the old French fort should fall within the cessions hereby made to the United States, the same shall nevertheless be, and hereby are, reserved for the use of this State, with the right of erecting mills thereon, but no buildings, mills excepted, shall be erected within six hundred yards of the center of any fort, which shall be erected by the United States on either of the lots ceded to them as aforesaid: Provided also, That it shall be lawful to lay out and open convenient roads through such parts of the said three lots, as the reasonable accommodation of the State or its citizens may require, without injury to the United States in respect to the true object of the cession, and it is the express intent and meaning of this act, that nothing herein contained shall be deemed, construed, or in any wise taken to cede and transfer unto the United States the jurisdiction or right of soil in and to the said three last mentioned lots, but only the occupancy and use thereof for the purposes aforesaid.

Section V. And be it further enacted by the authority aforesaid, That the said commissioners shall also survey, or cause to be surveyed three hundred acres for town lots, and seven hundred acres of land adjoining thereto, for out lots, at the most eligible place within the tract heretofore reserved for public use at the mouth of French creek; and the lands so surveyed shall be respectively laid out and divided into town lots and out lots, in such manner, and with such streets, lanes, alleys, and reservations for public uses, as the said commissioners shall direct; but no town lot shall contain more than one-third of an acre, no out lot shall contain more than five acres, nor shall the reservations for public uses exceed in the whole ten acres; and the town hereby last directed to be laid out shall be called "Franklin," and all the streets, lanes and alleys thereof, and of the out lots thereto adjoining, shall be and forever remain common highways.

Section VI. And be it further enacted by the authority aforesaid, That the said commissioners shall file a draft, return and report of the survey, and proceedings made and executed with respect to the said last mentioned town and out lots; and the Governor shall proceed to sell at public auction, and to convey to the respective purchasers one-third of the town lots and one-third of the out lots, in like manner, with like power and authority, and subject to the like regulations, restrictions, terms, conditions and forfeitures, as are herein before provided touching the survey, return, sale and conveyance of the town lots and out lots directed to be laid out at or near to Presque Isle.

Section VII. And be it further enacted by the authority aforesaid, That the said commissioners shall also survey, or cause to be surveyed, three hundred acres for town lots, and seven hundred acres of land adjoining thereto for out lots, at the most eligible place within the tract heretofore reserved for public use at the mouth of Conewango creek; and the lands so surveyed shall be respectively laid out and divided into town lots and out lots, in such manner, and with such streets, lanes, alleys and reservations for public uses, as the said commissioners shall direct; but no town lot shall contain more than one-third of an acre, no out lot shall contain more than

five acres, nor shall the reservations for public use exceed in the whole ten acres; and the town hereby last directed to be laid out shall be called "Warren," and all the streets, lanes and alleys thereof, and of the lots thereto adjoining, shall be and remain common highways.

Section VIII. And be it further enacted by the authority aforesaid, That the said commissioners shall file a draft, return and report of the survey and proceedings, made and executed with respect to the said last mentioned town and out lots; and the Governor shall proceed to sell at public auction, and to convey to the respective purchasers, one-third of the town lots and one-third of the out lots, in like manner, with like power and authority, and subject to the like regulations, restrictions, terms, conditions and forfeitures, as are herein before provided touching the survey, return, sale and conveyance of the town lots and out lots directed to be laid out at or near to Presque Isle.

Section IX. And whereas, Andrew Ellicott lately surveyed and laid out a town, within the tract heretofore reserved for the public use at Le Boeuf, near the head of the navigation of French creek, and the draft and plan of the said town being communicated by the Governor to the General Assembly, was by them approved: Therefore be it enacted by the authority aforesaid, That the said draft and plan of the town so surveyed and laid out by the said Andrew Ellicott, within the tract heretofore reserved for public use at Le Boeuf aforesaid, being first recorded in the office of the Secretary of the Commonwealth, and the original thereof deposited in the office of the Surveyor General, shall be, and the same is hereby, in all respects, accepted, ratified, confirmed and established as fully and effectually, as if it had been made by virtue of a law previously authorizing a town to be surveyed and laid out at Le Boeuf, agreeably to the division, and with such streets, lanes, alleys and reservations for public uses, as are in the said draft or plan particularly contained, and the commissioners hereinbefore directed to be appointed shall also survey, or cause to be surveyed, five hundred acres of land, adjoining the said last mentioned town, for out lots; and the same shall be divided in such manner, and with such streets, lanes and alleys, as the said commissioners shall direct, but no out lot shall contain more than five acres, nor shall the reservation for public uses exceed in the whole ten acres; and the said last mentioned town shall be called "Waterford," and all the streets, lanes and alleys thereof and of the out lots thereto adjoining, shall be and for ever remain common highways.

Section X. And whereas sundry persons have already built and erected houses within the said last mentioned town, and it is reasonable that they should thereby acquire a right of pre-emption to the lots on which they are respectively settled: Therefore be it enacted by the authority aforesaid, That the several persons who have actually settled and built houses on the several lots, which in the said draft or plan of the last mentioned town are numbered, respectively, nineteen, twenty, twenty-one, twenty-two, seventy-six, seventy-seven, one hundred and fifty-six, one hundred and sixty-one, and two hundred and seventy-six, or their heirs and assigns, shall, at the expiration of two years from and after the passage of this

act, be entitled to claim, and have patents for the said lots respectively, upon the conditions hereinafter specified, that is to say; that they shall respectively give satisfactory proof to the Court of Common Pleas of the proper county, who shall certify the same to the Governor, that they, or some persons representing them respectively, have constantly resided on their respective lots, for and during the said term of two years; and also shall, on one month's notice, pay into the treasury a sum equal to the price which shall be bid for any lots of similar dimensions, and of similar situations, of which the Governor shall be the judge, within the said last mentioned town, at the sale hereinafter directed to be made; and the Governor shall not grant or issue any patent, nor from and after the expiration of the said term of two years, shall the settlement of such persons respectively, or any provision in this act contained, be deemed or construed to vest in the respective settlers any title, interest, claim or demand, in law or equity, to the lots on which they are respectively settled as aforesaid, but all payments previously made shall thenceforth be forfeited to the Commonwealth.

Section XI. And be it further enacted by the authority aforesaid, That the said commissioners shall file a draft return and report of the survey and proceedings made and executed with respect to the said last mentioned out lots, and the Governor shall proceed to sell at public auction, and to convey to the respective purchasers, one-third of the town lots and one-third of the out lots last mentioned (exclusively of those lots that shall be reserved for public uses, and those that are appropriated in favor of the present settlers thereon, by the next preceding section of this act) in like manner, with like power and authority, and subject to the like regulations, restrictions, terms, conditions and forfeitures, as are herein before provided touching the survey, return, sale and conveyances of the town lots and out lots directed to be laid out at or near to Presque Isle.

Section XII. And be it further enacted by the authority aforesaid, That one-half of the town lots and out lots to be sold in pursuance of this act shall be sold in the city of Philadelphia, one-fourth in Carlisle, in the county of Cumberland, and one-fourth in Pittsburgh, in the county of Allegheny.

Section XIII. And be it further enacted by the authority aforesaid, That it shall be lawful for the Governor, with the consent of the individuals respectively, to protract the enlistment of such part of the detachment of State troops, or such part thereof as are or may be in garrison at Fort Le Boeuf, or to enlist as many men as he shall deem necessary, not exceeding one hundred and thirty, for the term of eight months (unless sooner discharged), from and after the expiration of the present term of enlistment, for the same pay and allowance as are now paid and allowed to the said detachment, and to draft and employ a competent number from the said garrison, to protect and assist the Commissioners, Surveyors and other attendants, intrusted with the execution of the several objects of this act: Provided always nevertheless, That as soon as a fort shall be established at Presque Isle, and the United States shall have furnished adequate garrisons for the same, and for Fort Le Boeuf, the Governor shall discharge the said detachment of state troops, except the party thereof employed in protection and assisting the Commis-

sioners, Surveyors, and other attendants as aforesaid, which shall be continued until the objects of this act are accomplished, and no longer.

Section XIV. And be it further enacted by the authority aforesaid, That if occurrences shall take place, which, in the opinion of the Governor, will make it requisite that a greater force than the aforesaid detachment will be necessary to carry into effect the purposes of this act, or if, in his opinion from the continuation of hostilities by the Indians, it will be requisite for the defence of any part of the western frontiers, he may, at his discretion, raise one complete company of expert riflemen, to consist of one captain, one lieutenant, one ensign, four sergeants, four corporals, one drummer and fifer, or two buglers, and sixty-five privates, to serve until the first day of December next, unless sooner discharged, who shall be entitled to the same pay and rations, and be under the same regulations and restrictions, as the troops directed to be raised by an act passed the twenty-eighth day of February, in the year of our Lord one thousand seven hundred and ninety-four, entitled "An Act for more effectually securing the trade, peace and safety of the port of Philadelphia, and defending the western frontiers of this Commonwealth."

Section XV. And be it further enacted by the authority aforesaid, That in order to defray the expenses of making the survey at Fort Le Boeuf, and the various surveys and sales herein directed, and to maintain the garrison at Fort Le Boeuf, there shall be, and hereby is, appropriated the sum of seventeen thousand dollars, to be paid by the Treasurer on the warrants of the Governor; and the accounts of all disbursements, services and expenses, made and incurred in pursuance of this act, shall be exhibited and settled agreeably to the laws for settling other public accounts.

Section XVI. And be it further enacted by the authority aforesaid, That the act entitled "An Act for laying out a town at Presque Isle," passed the eighth day of April, one thousand seven hundred and ninety-three, and the supplements thereto, passed the eighteenth day of April, one thousand seven hundred and ninety-four, shall be, and the same are hereby, repealed.

Passed 18th April, 1795.

See the "Act to provide for selling the several reserved tracts of land adjoining the towns of Erie, Franklin, Warren and Waterford, and for other purposes therein mentioned," passed 11th April, 1799, in this volume, Post. (Chap. 2069.)

See also "A supplement to the several acts relative to establishing town and out lots, and selling the same, within the reserved tracts of land adjoining Erie, Franklin, Warren and Waterford," passed 19th February, 1800, in this volume, Post (Chap. 2096), by which the improvement clauses as to lots in these towns is repealed; and pre-emption given to persons who had paid any money for, or improved any of said forfeited lots, at the prices they had been sold for provided application, and payment, were made within twelve months. Which was extended for one year, by act of 26th February, 1801. (Chap. 2189).

The first section of the town of Erie, was erected into borough, by act of 29th March, 1805. (Chap. 2577.)

Two thousand dollars were granted to the commissioners, for the purpose of erecting public buildings in the town of Erie, for the use of the county; by act of 16th March, 1807 (Chap. 2772). (See "Erie County," in the General index.)

By an act passed 20th March, 1811, entitled "A Supplement to an act entitled An Act to provide for selling the several reserved tracts of land adjoining the towns of Erie, Franklin, Warren and Waterford, and for other purposes therein mentioned," the Governor is directed to appoint two persons, who, together with the commissioner of sales, are to appraise all the in lots in squares, and the out lots in the second section of Erie, which appraisement shall be entered in a book for that purpose, they shall then advertise the lots for sale on a day certain; but no contract shall be confirmed until sixty days after opening the books; and the terms prescribed, in yearly installments; the bonds to be sent to the Secretary of the Land Office within six months; who shall issue patents to the purchasers, on payment according to the sales. The commissioner and persons appointed to be under oath or affirmation and to receive a certain compensation.

The Beach of the lake, from the upper corner of the garrison tract, and for twenty perches back from the water's edge, down the lake to the out lots, and from thence down the same, including all the land between the out lots and the water's edge, to the tract of land No. 38, shall be and remain a public landing for the use of the inhabitants and others, until otherwise appropriated by law; and penalty for obstructing the said landing.

By an act passed 2d April, 1811. The occupancy and use of certain lands near Presqu' Isle, not less than two nor more than four acres, are ceded to the United States, for the purpose of erecting a lighthouse, commissioners appointed to survey and lay it off, and transmit the draft thereof to the Secretary of the Treasury of the United States. The jurisdiction and right of soil excepted by the state.

An academy is incorporated in the borough of Erie, by act of 2d April, 1911. And five hundred acres of the reserved lands, adjoining the town and fifteen town lots, are granted to the said academy, for the use thereof, etc.

Two out lots of the town of Franklin, ceded to the United States, by act of 1st February, 1796 (Chap. 1858), post.

An act to provide for selling the several reserved tracts of land adjoining the towns of Erie, Franklin, Warren and Waterford, and for other purposes therein mentioned.

Section 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same, That the Governor is hereby empowered to direct the Surveyor-General to make, or cause to be made, actual surveys of the reserved tracts of

land adjoining the towns of Erie, Franklin, Warren and Waterford, which have not been laid out in town or out-lots, or ceded to the United States, and to lay off the same into lots, not exceeding one hundred and fifty acres in each, and marking the lines thereof, and designating first, second or third quality in said drafts: Providing always, That in each of the said reserved tracts the quantity of five hundred acres be laid off, for the use of such schools or academies as may hereafter be established by law in the said several towns; which said several surveys shall be returned to the office of the Surveyor General, and general drafts thereto to the office of the Secretary of the Commonwealth.

Section 2. And be it further enacted by the authority aforesaid, That the Governor, after the said actual surveys shall be made, and general drafts thereof lodged in the office of the said secretary, be, and he is hereby authorized and required to transmit a copy of each draft to the Commissioner to be appointed for the sale of the in and out-lots in and adjoining the towns of Erie, Franklin, Warren and Waterford, as soon as conveniently may be; and it shall then be the duty of the said commissioners, to give notice by advertisement, at least six weeks, in three of the public newspapers in the city of Philadelphia, in at least one paper printed in Dauphin county, one in Pittsburgh, one in Lancaster, and one in Washington, of the time that the books will be open for the sale of all the reserved lands laid out by virtue of this act, adjoining the above towns, on the following terms, to wit: one-fifth part of the purchase money shall be paid at the time of sale to the commissioner attending; one-fifth part to the Receiver-General of the Land Office, within twelve months from the day of sale; one-fifth part within two years from the said day; and the remaining two-fifth parts at or before the expiration of three years after such sale; but that no contract shall be confirmed by said commissioner for fifteen days after the said books shall be opened, and the highest price offered within that time shall be accepted.

Section 3. And be it further enacted by the authority aforesaid, That it shall be the duty of the commissioner to enter the purchaser's name in his book, the number, quality and quantity of acres, date of entry, the amount of sale, a certified copy of which he is to give to the purchaser, which certificate shall be forwarded to the Secretary's office within six months after the date thereof; but no sales shall take place at less than four dollars per acre for land of first quality, three dollars per acre for land of the second quality, and two dollars per acre for land of the third quality: Provided always, That nothing herein contained shall be taken or construed to vest any right or title, in law or equity, in any person or persons purchasing as aforesaid, unless he, she or they shall, within three years after the date of their respective purchases, make an actual settlement thereon, by clearing, fencing and cultivating at least two acres for every fifty acres contained in one survey, and erect on each lot or tract a messuage for the habitation of man, and reside thereon for the space of five years following their first settlement of the same; and in default of such actual settlement, residence and improvement, the purchaser or purchasers shall forfeit all payments made to the Commonwealth, and the Governor is hereby authorized to direct that such forfeited lot or tract be sold at public sale, in

the town near where such forfeited lot or tract may lay; and no patents shall issue for any lot or tract sold by virtue of this act, until satisfactory proof be made to the Governor of this Commonwealth of such actual settlement, residence and improvement having been made as aforesaid.

Section 4. And be it further enacted by the authority aforesaid, That the Governor be, and he is hereby authorized to appoint four commissioners, one of which shall reside in each town, whose duty it shall be, with the assistance of two reputable citizens, appointed by the Judges of the Court of Common Pleas of the county of Allegheny, for each commissioner to appraise all the in and out lots in the towns of Franklin, Warren and Waterford, and the first section of Erie, and the out-lots thereto adjoining, which appraisement shall be regularly entered in a book for that purpose. It shall then be the duty of the commissioners aforesaid to advertise the town and out-lots for sale, on the following terms, to wit: the one-third part of the purchase money shall be paid at the time of sale to the Commissioner attending, when the entry of sale is made, whose duty it shall be to certify the same; one-third part to the Receiver General of the Land Office, within twelve months from the day of sale; and the remaining one-third part within eighteen months from the day of sale; for the performance of which the purchasers respectively, shall, at the time of sale, give bond for the payments of the said installments to the said commissioners; and at the expiration of eighteen months, aforesaid, the Governor is hereby authorized to grant patents to the purchasers, provided the purchase money is paid according to the sales.

Section 5. And be it further enacted by the authority aforesaid, That those persons who have purchased any lot or lots in the second and third divisions of the town of Erie, may take lot or lots in the first division of said town, at the same price they purchased them at the former sales, and that all those who have paid for or improved any forfeited lot or lots shall have a pre-emption to said lot or lots, at the prices they sold for at former sales; provided he, she or they apply within three months after the passing of this act, and pay for the same.

Section 6. And be it further enacted by the authority aforesaid, That the commissioner at the town of Erie shall offer at public sale the lot of ground reserved in said town, at the mouth of Cascade creek, including the same, after giving three months notice in three of the public newspapers of this State, of the time and place of such sale, on the same conditions specified in the third section of this act: Provided the same amounts to fifty dollars per acre.

Section 7. And be it further enacted by the authority aforesaid, That the said commissioners, before they enter on the duties required by this act, shall give bond, with two good sureties, in a sum not less than five thousand dollars, to the Governor, each, conditioned for the true and faithful performance of their respective trusts, and shall receive three cents on every dollar received and contracted for, which shall be in full for all their services, and the persons appointed by the court to assist each commissioner to appraise the town and out-lots shall receive two dollars each per day, which shall be in full for all their services.

Passed April 11, 1799. Recorded in Law Book No. VII, page 24.

A supplement to an act entitled "An act to provide for selling the several reserved tracts of land adjoining the towns of Erie, Franklin, Warren and Waterford, and for other purposes therein mentioned."

Section 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same, That it shall be the duty of the governor to appoint two reputable citizens whose duty it shall be, together with the assistance of the commissioner of sales, to appraise all the in-lots in squares, and the out-lots in the second section of the town of Erie, and all streets heretofore laid out shall be left open for public highways, which appraisement shall be regularly entered in a book for that purpose; it shall then be the duty of the commissioner aforesaid to advertise the said squares and out-lots for sale, specifying particularly the day on which the sales shall commence, and no contract shall be confirmed by the said commissioners for sixty days after the said books shall be opened, and the highest price offered within that time shall be accepted, provided it is not below the appraisement, and the terms shall be as follows: the one-third part of the purchase money shall be paid at the time of sale to the commissioner attending when the entry of sale is made, whose duty it shall be to certify the same; one-third part to the secretary of the land office within twelve months from the day of sale; and the remaining one-third part within two years from the day of sale; and the bonds directed to be taken by the act to which this is a supplement, by the commissioner for the second and third installments, shall be transmitted to the secretary of the land office within six months after they are taken, and at the expiration of the two years aforesaid, the secretary of the land office is hereby authorized and required to grant patents to the purchasers: Provided, the purchase money is paid according to the sales.

Section 2. And be it further enacted by the authority aforesaid, That the commissioner and persons appointed to appraise the property aforesaid, before they proceed to perform the duties required of them by this act, they shall take and subscribe an oath or affirmation before some justice of the peace to perform the duty required of them with fidelity and impartiality, and shall receive two dollars each per day while necessarily employed in appraising the lots aforesaid, which shall be in full for that service.

Section 3. And be it further enacted by the authority aforesaid, That the beach of the lake from the upper corner of the garrison tract, and for twenty perches back from the water's edge down the lake to the out-lots, and from thence down the same, including all the land between the out-lots and the water's edge, to the tract of land No. 38, the property of John Kelso, shall be, and remain a public landing for the use of the inhabitants and others until otherwise appropriated by law; and any person obstructing said landing shall pay for every such offense the sum of twenty dollars, to be recovered before any justice of the peace of the county of Erie, in the

same manner as other fines are recoverable, which shall be applied to improving the roads from the town of Erie to and from the said landing.

Passed 20th March, 1811. Recorded in Law Book No. XII, page 309.

An act for erecting certain parts of the counties of Westmoreland and Washington into a separate county.

Section 1. Whereas the inhabitants of those parts of the counties of Westmoreland and Washington, which lie most convenient to the town of Pittsburg, have, by petition, set forth, that they have been long subject to many inconveniences, from their being situated at so great a distance from the seat of judicature in their respective counties, and that they conceive their interest and happiness would be greatly promoted by being erected into a separate county, comprehending the town of Pittsburg; and as it appears just that they should be relieved in the premises, and gratified in their reasonable request:

Section 2. Be it enacted, and it is hereby enacted by the Representatives of the Freemen of the Commonwealth of Pennsylvania, in General Assembly met, and by the authority of the same, That all those parts of Westmoreland and Washington counties, lying within the limits and bounds hereinafter described, shall be, and hereby are, erected into a separate county; that is to say, beginning at the mouth of Flaherty's run, on the south side of the Ohio river; from thence, by a straight line, to the plantation on which Joseph Scott, Esquire, now lives, on Montour's run, to include the same; from thence by a straight line, to the mouth of Miller's run, on Chartier's creek; thence by a straight line, to the mouth of Perrys mill run, on the each side of the Monongahela river; thence up the said river, to the mouth of Becket's run; thence by a straight line, to the mouth of Sewickley creek, on Youghiogeny river; thence down the said river, to the mouth of Crawford's run; thence by a straight line, to the mouth of Brush creek on Turtle creek; thence up Turtle creek, to the main fork thereof; thence by a northerly line, until it strikes Puckety's creek; thence down the said creek to the Allegheny river; thence up the Allegheny river, to the northern boundary of the state; thence along the same, to the western line of the state; thence along the same, to the river Ohio; and then up the same, to the place of beginning; to be henceforth known and called by the name of Allegheny county.

Section 3. And be it further enacted by the authority aforesaid, That the inhabitants of the said county of Allegheny shall, under the limitation hereafter mentioned, at all times hereafter, enjoy all and singular the jurisdictions, powers, rights, liberties and privileges whatsoever, which the inhabitants of any other county of this state do, may, or ought to enjoy, by the constitution and laws of this state.

Section 6. And be it further enacted by the authority aforesaid, That the Justices of the Supreme Court, and the Justices of Oyer and Terminer and General Gaol Delivery of this state, shall have like powers, jurisdictions and authorities, in the said county, as in the other counties of this state, and are hereby authorized and empowered to deliver the gaols of the said county of capital and other offenders, in like manner as they are authorized to do in the other counties of this state.

Section 7. And be it further enacted by the authority aforesaid, That the Justices of the Courts of Quarter Sessions and Common Pleas now commissioned within the limits of the said county, and those that may hereafter be commissioned, or any three of them, shall and may hold courts of General Quarter Sessions of the Peace and Gaol Delivery, and courts of Common Pleas, and shall have all and singular such powers, rights, privileges, jurisdictions and authorities, to all intents and purposes, as other Justices of the Courts of General Quarter Sessions and Justices of the Common Pleas, in other counties of this state, may, can, or ought to have in their respective counties; which courts shall sit and be held for the said county (until the trustees hereinafter appointed shall have erected a court house, agreeably to the directions of this act) in the town of Pittsburg, four times in each and every year, on the Tuesdays next preceding the county courts of Fayette county; and the court of Quarter Sessions shall sit three days in each session, if occasion be, and no longer; and also that Orphans' Courts in and for the said county of Allegheny shall be held in such manner, and shall have such powers, authorities and jurisdictions, as are by the laws and constitution of this commonwealth, provided as to the Orphan Courts of any county or counties within this Commonwealth.

Section 12. And be it further enacted by the authority aforesaid, That the Sheriffs, Treasurers, Collectors of excise, and all such officers, as have heretofore usually given bail for the faithful discharge of their respective offices, who may hereafter be appointed or elected in the said county of Allegheny, before they, or any of them, shall enter upon the execution of their respective offices, shall give sufficient security, in the like sums, in the like manner and form, and for the like uses, trusts and purposes, as such officers are obliged by law, for the time being, to do in the counties of Westmoreland and Washington.

Passed 24th September, 1788. Recorded in Law Book No. III, page 412.

An Act for the sale of the vacant lands within this Commonwealth.

Section XIII. And be it further enacted by the authority aforesaid, That the following tracts of land shall be reserved for the use of the Commonwealth, that is to say: at Presque Isle formed by Lake Erie, the island or peninsula which forms the harbour, and a tract extending eight miles along the shore of the Lake, and three

miles in breadth, so as to include the tract already surveyed, by virtue of a resolution of the General Assembly, and the whole of the harbour formed by the said Presque Isle, at the mouth of Harbour creek, which empties into the Lake Erie, and along the shore of the Lake, on both sides of said creek, two thousand acres.

Section XIV. And be it further enacted by the authority aforesaid, That all the lands within the triangle on Lake Erie, purchased from the United States, shall be taken and deemed, and they are hereby declared to be, within the limits of the county of Allegheny.

Section XV. And be it further enacted by the authority aforesaid, That it shall and may be lawful to and for the holder or holders of any unsatisfied warrant or warrants, heretofore issued for lands, agreeably to the seventh section of the act, entitled "An Act to alter and amend an act of Assembly, entitled 'An Act for opening the Land Office, for granting and disposing of the unappropriated lands within this state,'"* passed on the twenty-first day of December, in the year one thousand seven hundred and eighty-four, to locate the quantity of land for which such unsatisfied warrant and warrants was and were granted, in any district of vacant and unappropriated land within this Commonwealth; provided the owner or owners of such unsatisfied warrants shall be under the same regulations and restrictions, as other owners of warrants taken for lands lying north and west of the Allegheny river and Conewango creek, are made subject by this act, the said recited act, or any other act or acts of the General Assembly, to the contrary thereof in anywise notwithstanding.

Passed 3d April, 1792.

PENINSULA TITLE.

There is considerable conflicting opinion as to wherein the title to the Peninsula lies. This has been brought about by recent discussion of the matter and possibly one of the most clear expositions of the case so far published appears in the "Ramblers' Etchings" in the Dispatch this morning by Judge Galbraith.

From what the Judge says the title is equally vested in the State of Pennsylvania and the United States. A careful search of the records has been made by Captain John Fleeharty, who furnishes to the Dispatch all the notes covering the period from earliest times. These notes and references and copies made by Captain Fleeharty are most exhaustive and cover all laws up to the present time, all deeds and references to the Peninsula. By the act of February 4, 1869, a part of Erie purchase was conveyed to the Marine Hospital Association as Judge Galbraith says. The deed is recorded in deed book 34, page 435, Erie county records and date of record October

21, 1869. Then in accordance with the act of 1871 the Garrison Grounds out-lot No. 555 and tract No. 2, 50 acres in third section of Erie is granted to the State of Pennsylvania for "one dollar." See patent book H, vol. 61, page 476. In accordance also with this act of Assembly of May 11, 1871, a deed was made to the United States of the Peninsula property and is recorded in Erie in deed book 40, pages 634 and 637 and dated August 18, 1871, the deed being drawn July 17, 1871, in accordance with the act, conveying all title the Marine Hospital had to the Peninsula to the United States. The principal clause of present interest reads:

"Containing 2.024 acres as near as may be being same piece of land granted to said Marine Hospital by patent dated October 18. A. D. 1869,—to be held by the United States as near as may be in its present condition and only for the purposes of national defense and for the protection of the Harbor of Erie,—to be only proper use and behoof of said United States of America."

While the act states that:

"In all other respects to be subject to the civil and criminal jurisdiction of the State of Pennsylvania; and the consent of the State of Pennsylvania is hereby given to such transfer of title only for the purposes and under the limitations herein before mentioned."

The deed does not have this clause. Judge Galbraith cites the statutes of 1871, and that possession was taken by the United States Government previous to 1886. However, if this is so, and the statutes so state, why was it necessary to have an act passed in 1886 accepting it. Such an act was passed as a rider to an appropriation bill August 5, 1886. (See Cong. Record, 49th Congress, 1st ses., page 3790.) It was introduced and advocated by Hon. Wm. L. Scott and was for the

"Improving Harbor of Erie, continuing the improvement and also for the improvement of said Harbor, as recommended by the Chief Engineer, January 13, 1885."

"Provided that the Secretary of War be and he is hereby authorized and directed to receive and accept for the United States from the Marine Hospital of Erie, Pa., the title to the Peninsula of Presque Isle at Erie, Pa., as tendered by said Marine Hospital, agreeably to the provisions of an act of the Legislature of Pennsylvania approved May 11, 1871, and provided further that \$22,500 of said sum shall not be expended until the aforesaid title shall be accepted by the Secretary of War."

This act passed. In a letter from the Chief Clerk of the Interior Department, to Hon. W. C. Culbertson in 1889, he goes into some detail and speaks of the "acceptance of the deed" of 1871, under an opinion by the Judge Advocate General, given on Nov. 18, 1886, whereby the United States might so accept "by entering upon and taking possession of the land in behalf of the United States," which the Secretary of War afterwards did.

In those days there was much talk about this deed of the Peninsula to Mr. B. Lowry who was the President of the Marine Hospital, and others. It was made pretty warm for the then Senator from

Erie county, and the upshot was this final transfer. The Dispatch takes pleasure in giving these facts and submits them without caring to express an opinion. There are those who hold that the act of 1886 with the acceptance of "title" mentioned and the further fact that the deed of 1871 does not mention the State as a partner with the United States, gives the Government clear title. Other attorneys and among them another able ex-Judge holds with Judge Galbraith. Altogether it is a most interesting question.

RAMBLER'S ETCHINGS.

The query as to the title of the Peninsula, propounded in the Etchings a couple of days ago, has elicited clear, instructive and complete information relative to it, at the expense of considerable research by Hon. Wm. A. Galbraith, and the Rambler is giving sound advice to Erie citizens who wish to know "where we are at" on the absorbing subject by telling them to cut it out for future reference. It is as follows:

"Erie, Pa., Nov. 19, 1895.

Sam Woods, Esq. (Rambler):

Answering your question as to the ownership of the Peninsula of Presque Isle, I find, on a careful examination of the various acts of assembly and other records, that while the right of occupancy and control is vested in the government of the United States, the title and actual ownership remains in the State of Pennsylvania.

On February 4, 1869, the Legislature of Pennsylvania passed an act "supplementary to the act incorporating the Marine Hospital at Erie," which after a preamble reciting that "the councils of the City of Erie have so neglected the management and supervision of the Peninsula, which forms the northern boundary of the Harbor of Erie as to prevent any adequate revenue arising therefrom, therefore, be it enacted, &c., That section 14 of the act of April 2, 1868, entitled 'A further supplement to an act to incorporate the City of Erie' be so amended as to place the supervision and control of the said Peninsula in the power of the Board of Directors of the Marine Hospital of Pennsylvania, * * * and the said Board of Directors are hereby empowered to exercise such supervision, disposition, and control of the same by leasing, or otherwise, as to them shall be deemed for the best interest of said Hospital."

In 1871, by the act of Assembly passed May 11, of that year, an appropriation of \$30,000 was made to the Marine Hospital at Erie, but only on the condition that the corporation should reconvey to the State all the lands granted by their act of incorporation in 1867, and on the further condition that the said Marine Hospital 'shall

convey to the United States of America all title it may have to the Peninsula of Presque Isle * * * to be held by the United States, as near as may be, in its present condition and only for the purposes of national defense and for the protection of the Harbor of Erie, but in all other respects, to be subject to the civil and criminal jurisdiction of the State of Pennsylvania; and the consent of the State of Pennsylvania is hereby given to such transfer of title only for the purposes and under the limitations herein before mentioned.'

An act of Congress was passed in the same year, 1871, (U. S. Statutes, vol. 24, page 312), by which the Secretary of War was directed to receive and accept title under the act of May 11, 1871, just recited, and on May 25, 1871, a deed was duly executed by the Marine Hospital officers and directors and accepted by the Secretary of War and possession was taken by the United States Government; which ever since has had the custody and control of the same, although the actual title and ownership still remains vested in the State of Pennsylvania.

This condition need not hinder, however, the use of a portion of the peninsula on the bay front for manufacturing purposes, as it will no doubt be easy to secure such concurrent legislation by Congress and the State Legislature as may be necessary, in case public opinion should favor the same, as it no doubt will, should there be a strong demand for this particular location by those seeking eligible sites for the manufacture of iron, as now appears very probable.

The popular error and confusion of ideas as to the ownership of the Peninsula of Presque Isle has no doubt arisen from the official letter from the chief clerk of the Interior Department published in Miss Sanford's History of Erie County, where he speaks of the 'title' to said Peninsula being tendered to the United States; and in another place he refers to the deed conveying title being accepted, &c.

In fact, the United States government did not acquire any title but only, as you see by referring to the language of the acts, the right of possession and occupancy and that for a distinctly limited purpose, namely, 'national defense and for the protection of the Harbor of Erie' and in all other respects to be subject to the civil and criminal jurisdiction of the State of Pennsylvania.

Truly yours,

WM. A. GALBRAITH."

Erie is the geographical center of the iron trade and this generation will see whalebacks and deep draught barges unloading ore at the northwest angle of Big Bend, on the south shore of the Peninsula, with clear water between that and the mouth of the Harbor, of not less than twenty-two feet in depth at its shallowest point.—Sam Woods in Evening News.

JUDGE GALBRAITH'S OPINION—THE ACT OF 1886 AND ITS
EFFECT ON PENINSULA TITLE NO REASON TO
CHANGE IDEAS.

Peninsula is Joint Property of the Government and the State and
Will Take Concurrent Action.

Editor Dispatch: My communication published in the Evening News and copied in your paper this morning as to the title of the Peninsula has elicited from the Evening Herald a lengthy notice which concludes, "Another opinion from Ex-Judge Galbraith, after hearing further evidence during a lapse of fifteen years, will be awaited with interest."

The writer complains that I do not refer to the act of Congress of 1886 as if this act had changed the status from what it was prior to its passage and as if it gave the United States a title in fee simple to the property in question and as if the omission was either from ignorance or design, I made no reference to it for the simple reason that it has no bearing whatever on the question.

The rights of the United States were fixed by the terms of the act of Assembly of May 11, 1871. The State was always careful to obtain the title in the Commonwealth. By the act of February 4, 1869, it gave to the Marine Hospital the "supervision and control," only and by the later law, passed May 11, 1871, the rights to be acquired by the United States were limited to possession, for two specific purposes, namely, "National defense and the protection of the harbor of Erie." And as if these terms were not sufficiently clear and explicit it was further stipulated that "the consent of the State of Pennsylvania is hereby given to such transfer of title, only for the purposes and under the limitations herein before mentioned."

The act of Congress of 1886 as did the prior act of 1871, expressly refers to the act of the Pennsylvania Legislature of May 11, 1871, by which the rights to be acquired by the general government are distinctly and expressly and in terms, limited to a mere occupancy for the two specified purposes of defense and harbor protection. It was upon these terms that the United States accepted the deed and took possession and there is no person or authority save that of the State of Pennsylvania, to be expressed through a future act of its general assembly, that can ever modify or change these restrictions and limitations. Certainly no act of Congress, nor a dozen acts of Congress, could do it. It does not require that one should be a lawyer to know that one of the two parties to a contract cannot alter its terms without the consent of the other. The limitation of a grant binding upon the grantee until they are changed by the consent of both parties. The old adage that it takes two to make a bargain, or to unmake one, is good law as well as good common sense.

I repeat, therefore, what I said in my former communication, that while the occupation and control of the Peninsula of Presque Isle

are vested in the United States the title and ownership are as they always have been, since the triangle was acquired—in the Commonwealth of Pennsylvania.

WM. A. GALBRAITH.

THE PENINSULA.

An Interesting Account of the Action Taken to Transfer the Land
Over to the Government.

The question of the ownership of the Peninsula is now receiving a great amount of attention, but for what reason nobody seems to know. It is true that there has been some newspaper talk about locating steel mills, blast furnaces, etc., on the land which separates the Bay from the Lake, but the matter has not been seriously considered by the capitalists of Erie. The site is most desirable, and it is the hope of every citizen that the project will not fade away like many other similar schemes inaugurated for the advancement of Erie's prosperity, but which ended with the plans laid out in the newspapers. Many of our citizens are of the opinion that the State of Pennsylvania holds the title to the land, while others are just as confident that the title is held by the United States.

Ex-Judge Galbraith has given his opinion to the newspapers. He quotes from the acts of Assembly and acts of Congress and then comes to the conclusion that the actual title and ownership still remains vested in the State of Pennsylvania. The researches made by Mr. Galbraith end in 1871; and for some unknown reason the Ex-Judge does not refer to the action taken by Congress in 1886, when the question of the Peninsula ownership was discussed in Congress by the late William L. Scott and others.

The question was one of the most important brought up by the Pennsylvania delegation and was debated at length. Mr. Scott encountered the opposition of Congressmen Hewitt, of New York; Oates, of Alabama; Springer, of Illinois, and others, who attempted with every means within their power to defeat the clause attached to the River and Harbor bill by Mr. Scott, but he succeeded in securing the action which was finally taken. Mr. Scott, before presenting the clause to the Committee on Rivers and Harbors, had submitted it to the best legal talent in the House, who had pronounced it without a flaw and fully covering the points which Mr. Scott intended to make. The clause attached to the bill was as follows:

"Improving Harbor of Erie, Pa.: Continuing the improvement and also for the improvement of said Harbor, as recommended by the Chief Engineer, January 13, 1885, \$37,500. Provided that the Secretary of War be and he is hereby authorized and directed to receive

and accept for the United States from the Marine Hospital of Erie, Pa., the title of the Peninsula of Presque Isle at Erie, Pa., as tendered by said Marine Hospital, agreeably to the provisions of an act of the Legislature of the State of Pennsylvania approved May 11, 1871, and provided further, That \$22,500 of said sum shall not be expended until the aforesaid title shall be accepted by the Secretary of War."

The Peninsula is now in charge of the War Department and the necessary papers were made out and placed on file. The transfer of the Peninsula to the National government secures beyond all question the preservation of our beautiful Harbor for all time to come. Should the appropriations in the River and Harbor bills ever prove insufficient, or should unforeseen circumstances ever arise calling for immediate work on the Peninsula in order to preserve it against the fierce storms of the Lake it will be the duty of the War Department to expend the necessary money from the funds appropriated to that Department.

There is a great amount of ancient history connected with the Peninsula. While the State controlled the Peninsula the trees were being cut down and the ultimate destruction of Erie Harbor was only a question of time. It was during this emergency that William L. Scott was called upon by the people of Erie, irrespective of party, to become a candidate for Mayor. The issue between Mr. Scott and his opponent was as to the policy and rights of the Marine Hospital to our water front and the Peninsula. Mr. Scott was elected, which insured the preservation of the Peninsula. Mayor Scott immediately moved on to Harrisburg. On the 11th of May, 1871, a bill was passed appropriating to the Marine Hospital at Erie \$30,000 to complete the structure, provided said corporation conveyed to the United States all title it may have to the Peninsula, obtained from the State of Pennsylvania by act of February 4, 1869. A bill was subsequently passed by the Legislature conveying the Peninsula to the United States. Mr. Scott paid out of his own pocket \$2,500 for expenses connected with the transfer.

The Secretary of the Marine Hospital drew a deed which was executed by the proper officers of the Hospital. The Attorney General of the United States, however, found objections to its acceptance on the ground that an act of Congress did not authorize the Secretary of War to accept a title in the form offered by the State of Pennsylvania.

Mr. Scott's term as mayor expired and he left his successor to complete the work he had commenced to save the Peninsula, but nothing was done. The cutting of the timber, however, was stopped. After 13 years, Mr. Scott was elected to Congress and he found that the Peninsula had been hanging without being under the control of either the State or National government.

William A. Stone, United States Attorney for Western Pennsylvania, on August 23, 1882, had written that the only way to remedy the difficulty was to have Congress pass an act authorizing the Secretary of War to accept the title proffered by the State by act of 1871.

Mr. Scott secured from William C. Endicott, Secretary of War, a report showing the exact condition of affairs. Mr. Scott asked for the appointment of a watchman for the Peninsula and in a personal

letter dated Washington, Nov. 6, 1885, the Secretary of War stated that owing to the fact that neither Congress or the Legislature of Pennsylvania having taken the necessary action to legalize the deed proffered, the appointment of a watchman could not be made.

Mr. Scott also secured an official letter from the acting Chief Engineers, which sustained the action taken by the Secretary of War in refusing to appoint a watchman.

Congressman Scott at once began preparations to secure the passage of an act permitting the War Department to accept the Peninsula with the provisions that the land should be protected for all time to come. It was then too late to have an act passed by both branches and as noted above, Mr. Scott consulted with the legal lights of the House and he had the amendment printed above attached to the River and Harbor bill. It was a fine piece of legislative work and the Erie Congressman received many compliments from the leaders in the House and Senate.

The Pennsylvania deed was accepted and the government appointed a watchman and ever since that time the property has been kept by Uncle Sam.

The people of Erie wanted the Peninsula protected and through the efforts of Mayor William L. Scott and afterwards Congressman Scott, the land was transferred to the National government.

Judge Galbraith, in his opinion printed in this morning's Dispatch, says that the deed from the Marine Hospital was accepted by the Secretary of War in 1871. The Judge must be mistaken in this. The Herald of October 26, 1886, contains the letter from the Secretary of War in which he says that the government has no jurisdiction over the Peninsula and therefore Mr. Scott's request for a watchman is refused.

Among other things, Judge Galbraith says: "The act of Assembly of 1871 says that upon the transfer of the land by the Marine Hospital to the National Government it is to be held by said United States, as near as may be, in its present condition and only for the purpose of national defense, and for the protection of the Harbor of Erie, but in all other respects, to be subject to the civil and criminal jurisdiction of the State of Pennsylvania; and the consent of the State of Pennsylvania is hereby given to such transfer of title only for the purposes and under the limitations hereinbefore mentioned.

"In fact, the United States Government did not acquire any title but only, as you see by referring to the language of the acts, the right of possession and occupancy and that for a distinctly limited purpose, namely, 'National defense and for the protection of the Harbor of Erie,' and in all other respects to be subject to the civil and criminal jurisdiction of the State of Pennsylvania."

Judge Galbraith probably forgot that the matter was taken up again and pushed through by Mr. Scott. Another opinion from Ex-Judge Galbraith after hearing further evidence during a lapse of 15 years will be awaited with interest.

HISTORICAL ACCOUNT OF ERIE COUNTY, PENNSYLVANIA.

Every year during the season of travel, thousands of voyagers embark at Buffalo, in the State of New York, on board the magnificent steamers leaving that port for the voyage of the great lakes. The first point of interest at which these steamers stop, is the harbor and town of Erie, the only port possessed by Pennsylvania upon the lakes, and formerly known by the name of Presque Isle. This place is distant from Buffalo, ninety miles, and thus early in the voyage commences the enjoyment and interest derived from picturesque scenery and beauty of location. The lake shore rises into a bold bluff, the base being a slaty rock, to a height of eighty feet, and then spreads out into a broad irregular plain, covered with thickets of wild roses, with forests and farms. This plain is broken by ravines, through which are flowing rivulets either quietly to join the lake, or to tumble their waters in mimic falls over the rocky bed from which they have washed the superimposed soil. Seen from the deck of a steamer, the country back rises and sweeps away in a beautiful slope of varied hue, until its dark forest-crowned summit, at almost a mountain elevation, cuts against the sky. In reality it is a succession of plains or ridges, as though there had been successive elevations of the land, or depressions of the lake.

The harbor or bay of Presque Isle, is formed by a low and thickly wooded point or peninsula, which, shooting out from the bold bluff, bends around like a bowed arm, until its free extremity approaches a shoal or spit shooting from the coast below, and thus hugs in this beautiful bay, called Presque Isle, from the almost island character of this peninsula. The beautiful bay thus shut in is five miles in length by two in breadth, and has a depth of eighteen feet. Its entrance between the approaching points of land had originally but four or five feet; the erection of stone piers upon these points, by confining the channel, has given greater force to the currents and washed it out to the depth of nine feet.

On the plain overlooking this bay and peninsula, stands the town or borough of Erie, containing now between five and six thousand inhabitants.

This locality, so interesting in its natural arrangements and adornments, is also worthy of attention from its historical associations. Here was the commencement, within our territory, of the chain of French forts, which, crossing to the Ohio and Mississippi, were intended to unite Canada with Louisiana, and to shut out British rule from this region.

Here is located the scene of the youthful and daring adventures of Washington. Here General Anthony Wayne terminated his earthly career; and this point is intimately associated with one of the proudest naval achievements of our last war with Great Britain.

Before doing more than allude to these interesting associations, it may be better to give a short statement of the early political history and settlement of the country.

When the courtier quaker, as Macaulay represents him, William Penn, received from Charles II the grant of Pennsylvania, the charter prescribed that "the said lands were to be bounded on the north by the beginning of the three and fortieth degree of north latitude."

No measures were taken to ascertain where the said line would be located on the ground, until so late as the year 1785. Commissioners were then appointed on the part of Pennsylvania and on that of New York, to ascertain the northern boundary of the state from the river Delaware westward, to the northwest corner of Pennsylvania. The commissioners first appointed were David Rittenhouse, upon the part of Pennsylvania, and Samuel Holland, on the part of New York. They proceeded to act in pursuance of their appointment, and in December, 1786, ascertained and fixed the beginning of the forty-third degree of north latitude, erected suitable monuments thereof at and near the river Delaware, but were prevented, by the inclemency of the weather, from proceeding further in the survey. The next year Andrew Ellicott was appointed a commissioner for the above purpose, on the part of Pennsylvania, and James Clinton and Simeon Dewit, on the part of New York. In the year 1787, they completed the running and marking of this northern boundary line, two hundred and fifty-nine miles and eighty-eight perches, from its commencement at the Delaware river to its termination in Lake Erie, five or six miles east of the Ohio state line, and throughout the whole distance marked by mile-stones, each one indicating the number of miles it is distant from the river Delaware. In addition to these stones there are also throughout the line, mile-trees marked, in the same manner. In 1789, an act of assembly was passed confirming the acts of the commissioners and establishing the line run by them as the boundary between New York and Pennsylvania. This line running with such undeviating straightness from east to west, first gave to Pennsylvania a little corner upon Lake Erie, without port or harbor—a mere tantalizing look-out upon its broad expanse of blue waters, without any facilities for participating in the commerce which they were destined to bear. This county of Erie, and harbor of Presque Isle, were not then in the State of Pennsylvania. But by reference to the map, we see that the northern boundary of Pennsylvania is not now a rigid straight line, but that it makes a singular and sudden projection or shoulder jutting out upon Lake Erie—that the boundary line, as it draws near the lake, makes a sudden turn more to the north and runs out into the lake, cutting out a "huge cantle" of what was the acute southwest angle of New York, and we now proceed to some notice of this "Triangular Tract," as it is technically called.

To the jurisdiction and ownership of this important little piece of territory there were conflicting claims. New York claimed jurisdiction by virtue of her charter. Massachusetts made the same claim—the possession and ownership of the soil were with the aborigines.

The statesmen of Pennsylvania at an early day perceived the importance of having a front with a harbor upon the lake, and took the necessary measures to affect it. In pursuance with negotiations had upon that subject, New York ceded her right to the United States, and Massachusetts did the same. In the meantime Pennsylvania entered into arrangements to purchase from the Indians their

right to the soil and jurisdiction of the same tract; and on the ninth of January, seventeen hundred and eighty-nine, these were ceded for the sum of twelve hundred pounds. This, it is believed, was the last purchase made from the Indians by the State of Pennsylvania, extinguishing all native claim to lands within her borders—the same just and peaceful character marking the closing transaction on Lake Erie, in 1789, with which the first negotiation commenced on the Delaware in 1681.

On the third of March, 1792, the United States, for the sum of one hundred and fifty-one thousand six hundred and forty dollars and twenty-five cents, ceded to the State of Pennsylvania this important "Triangular Tract," containing two hundred and two thousand one hundred and eighty-seven acres.

Although the political right of possession and jurisdiction was now settled, this tract was still to be the subject of much individual dispute and litigation, very much retarding its settlement and improvement, or rather breaking them up after they had commenced. On the third of April, 1792, a law was passed by the state for the sale and settlement of all the vacant land lying north and west of the Ohio and the Allegheny rivers, and Conewango creek. This included all the lands from Pittsburgh to Lake Erie and west of the Allegheny river. Portions of this land in the different districts had been appropriated by the state in the way of donation to the officers and soldiers of the Pennsylvania line in the war of the revolution.

The law which provided for the sale and settlement of the vacant lands, stipulated that they should be granted to actual settlers in tracts of four hundred acres. The settlement, the extent and kind of which were specified, was required to be made within two years from the time of the grant, unless obstacles arose from the enemies of the United States, meaning, more particularly, the Indians. Under this law the lands were chiefly taken up by large speculating companies, though each tract was nominally in the right of separate individuals. The companies failed to comply with the stipulations of the law; requiring settlement, cultivation and improvement, within two years, and individuals thinking the company claim vacated, proceeded to settle and to make improvements upon the land. Here, again, were three kinds of claims: the revolutionary donation, the company settlement, and the individual occupation.

After much and protracted litigation, the final settlement was in favor of the company title, upon the plea that the Indians had offered obstacles to the settlement within the prescribed period. These difficulties spread abroad the impression that the titles to land in this district were not safe, and hence emigrants passed by and went into the adjoining part of Ohio—the Western or Connecticut Reserve, as it was formerly called—and hence the Western Reserve has an earlier and more wealthy settlement than this part of Pennsylvania. These uncertainties have, however, long since been terminated, and the county is steadily progressing in wealth, numbers and improvements.

There have been few, if any, pioneers in any of our new country who have had to encounter greater privations, hardships, sufferings and dangers, than the first settlers of Erie county. To a very late period the country was a wilderness, and the unprotected popula-

tion was exposed to the murderous attacks of the Indians. So recently as May, 1795, a Mr. Rutledge and his son were murdered by the savages at a point which now forms the junction of two of the principal streets of Erie.

Without roads through this wilderness, all the supplies had to be procured from Pittsburgh or through Canada. From Pittsburgh the supplies ascended in keel boats, the Allegheny river, French creek, Le Boeuf Creek, to where the village of Waterford now stands, fourteen miles from the lake shore, and from this point they were carried on pack-horses. The transportation from Canada was by bateaux. The first wheat grown in Erie county was carried more than one hundred miles to Chippewa, Canada, to be ground. The county of Erie and the adjoining county of Crawford, were surveyed and laid out into tracts of four hundred acres, as early as 1794, and a few adventurers pushed their way into the county of Erie at that time, but no permanent settlements were made until 1795 and 1796.

The great southern road which leaves the lake shore at Erie for Pittsburgh, immediately commences ascending the succession of ridges which have been described as characteristic of the formation of the country, giving us at each step a more extended view over the forests beneath us, the town, the bay, and the lake. About ten miles from the lake shore, the greatest elevation, about six hundred feet, is reached, and at the distance of fourteen miles, on the southern border of the county we descend into the pretty little valley, in which on the banks of a miniature lake, stands the town of Waterford. The little lake, called "Le Boeuf," empties into its waters by a small creek of the same name into French creek, and by this into the Allegheny and Ohio rivers. We have here these waters taking their rise in the same hills, and in proximity with each other, finding their way to the Atlantic by the distant channels of the Mississippi and the St. Lawrence. But we have now come to this point, from its interesting historical associations, as being the scene of the youthful achievements of Washington when in his twentieth year, in the service of Great Britain, and commissioned by Governor Dinwiddie, of Virginia, he accomplished his mission to the French posts of this region. It may not be out of place to recall the circumstances which required him to enter upon this service.

In Spark's Life of Washington, Chapter 3d, it is stated "The time was not at hand when the higher destinies of Washington were to unfold themselves. Intelligence came from the frontiers that the French had crossed the lake from Canada in force;" friendly Indians, seeing these aggressions and the strength of the French, were intimidated from their fidelity, and those of hostile feelings were encouraged to open aggression. One messenger had already been sent to meet these threatened dangers, but had shrunk from the accomplishment of his task. Under these circumstances, Washington was commissioned to proceed to the post of the intruders to protect against their aggressions and to warn them of the consequences.

The journey before him was nearly seven hundred miles, over rugged and untracked mountains; through a savage wilderness and savage tribes. Commissioner on the 31st day of October, 1753, he left Williamsburg, the Virginia seat of Government, on the same day, and on the 11th of December arrived at the French post on the little

lake of Le Boeuf. Washington records in his journal that on his way out during an interview with an Indian chief, the Half King, the chief, "informed me that they had built two forts, one on Lake Erie, and another on French creek, near a small lake, fifteen miles asunder, and a large wagon road between them. They are built after the same model but different in size, that on the lake being largest. He gave me a plan of them of his own drawings."

From his journal of the 13th of December, two days after his arrival, we have the following description of this fort:

"The chief officers retired to hold a council of war, which gave me an opportunity of taking the dimensions of the fort and making what observations I could.

"It is situated on the south or west fork of French creek, near the water, and is almost surrounded by the creek, and a small branch of it which forms a kind of island. Four houses compose the sides. The bastions are made of piles driven into the ground, standing more than twelve feet above it and sharp at the top; with port holes cut for cannons, and loop holes for the small arms to fire through. There are eight six pound pieces mounted on each bastion, and one piece of four pounds before the gate. In the bastions are a guard-house, chapel, a doctor's lodging and the commander's private stores; round which are laid platforms for the cannon and men to stand upon. There are several barracks without the fort for the soldiers' dwelling, covered, some with bark, and some with boards, made chiefly of logs. There are also several other houses, such as stables, smith shop, &c."

The locality of this early and important mission is now, as before mentioned, the village of Waterford. The French fort has disappeared, and the present road passes over part of its site; and frequently an old cannon ball, or some implement of corroded metal, turns up as a relic of its bygone days and occupants. The Le Boeuf hotel is in part constructed of the block house, which succeeded the French work, and the road from this work to that on the lake shore is still traceable.

It seems not a little remarkable, that Washington, at a time of life when curiosity is most active, being within two hours ride of the great lakes and the good road to conduct him to their shores, should not have visited them; especially, as in that day they must have been, from the great difficulty in reaching them, even a much greater wonder than they are now. From the minute character of his journal, it is evident that if he had visited the lake it would have been mentioned; there is no reason to believe that the French would have prevented him. He was at the Fort from the 11th until the 16th of December, and that he did not seek to gratify the natural curiosity which he must have felt, is worthy of remark, as showing how completely, even in such early youth, all private feelings were sacrificed to public duty. His constant vigilance was necessary, to prevent his Indians from being seduced from him; and on the 15th he says, "I cannot say that ever in my life I suffered so much anxiety as I did in this affair;" and in a preceding part of the journal he says, "as I had orders to make all possible dispatch."

When he had reached the French commander on Le Boeuf creek, the point to which duty called him was reached; and although, after

six weeks hard and perilous journeying, he was within a few hours of one of the most interesting natural phenomena of our globe, the youth of twenty in fulfillment of his duty, turned from wonders which annually invite hundreds across the Atlantic.

On the eastern edge of the town of Erie, are still to be seen the remains of the fort on the lake shore. It was picturesquely situated, at a point where the bluff is broken by a ravine through which flows a small creek. Here, then, was the commencement of the chain of works within our own territory, which was to unite Canada with Louisiana, and shut off the British rule and the British race from the belted territory. What an illustration of the pride and power of nations! of human sagacity and foresight! Scarcely one hundred years have rolled away; and as one stands mid these rooms of the monuments and means of military power and aggrandizement—of monopolizing associations, the mind is pleasantly oppressed by the wonderful events which crowd the time marked by these mementos of the past, and by the present moment. The lilies of France, which once floated here, where are they? No longer the emblem of a nation or a race; while the rival Cross of St. George has yielded to the Star Spangled Banner—the emblem of a nation and of institutions then unthought of and unimagined. Beneath the folds of the new born flag, the blue waters before us are dotted by the sails of commerce and dashed into foam by rushing steamers. The brook beneath us, which brawled through a lonely wilderness, is now silenced by the clattering of mills on its banks; where the solitary fortress has mouldered into a ruin before the civilization, the peaceful arts and animation of the popular city. The stripling youth who trod this wilderness, the modest messenger to France's proud knight St. Pierre, has his name and fame written on marble monuments and in the hearts of men, as the founder of a nation—the warrior of its flag, and the hero of the world.

Standing on the ruins of the old French fort, and looking over the ravine to its opposite bank, the eye is arrested by an isolated block house, of time blackened timbers, rising from the grass covered brow of the hill. This block house was erected in the winter of 1813-14, by the Pennsylvania Volunteers, then in the service of the United States. But on the spot where it stands, and in a block house which preceded this, one of America's most gallant sons breathed his last. It was here that "Mad Anthony" General Wayne ended his mortal career. He was on his way from the west, where he had been in the service of his country, when, in December, 1796, he sickened and died at this place, and was buried near the flag staff. In 1810, his remains were removed by his family, and found in such a state of peculiar preservation that the form of the body and features was preserved.

During the wanderings of his youthful exile in our country, the late King of the French, Louis Phillippe, found kindness and hospitality in Erie county. His host, a gentleman by the name of Reese, has but recently died. The cabin of this gentleman stood on what is now the corner of Second and French streets, in the town of Erie; and here he received and entertained the prince who was destined to a future of such varied and diverse fortune—from exile and beggary to a throne, and from that again to banishment and the protection of foreigners.

On the 8th of April, 1793, the first act was passed authorizing the laying out of the town at the Bay of Presque Isle, on the lands reserved at that place for the use of the State. Nothing appears to have been done in pursuance of this act; and in April, 1795, another act was passed, authorizing the Governor to appoint commissioners for the purpose. Andrew Ellicott, with others, were designated to survey and lay out a town at Presque Isle, to be called "Erie." It seems that, even at that early day, magnificent anticipations were formed of the importance and growth of this place, and room enough was given to gratify the largest expectations. The commissioners were directed to survey and lay out one thousand six hundred acres, for town lots, and three thousand four hundred acres for out-lots. The town thus laid out was divided into three sections, called the first, second and third sections of the town of Erie, the whole fronting three miles on the Bay. The first section, with a sprinkling in the second, is all that the town of Erie has so far been able to occupy. The anticipations of its early projectors may be realized, now that it promises to reap to the full the benefit of modern improvements. Plank roads are opening to it the surrounding country, and railroads are connecting it with the Hudson river and with the city of New York. At present the population of Erie consists of five thousand eight hundred and the county of forty thousand. Besides the town of Erie and Waterford, on the north and south lines of the county, it has two very pretty villages of about one thousand inhabitants each: Northeast, as its name indicates, in the northeast corner, and Girard, on the western border.

Just inside the mouth of Presque Isle Bay, and to the right hand coming in, is a small sheet of water spreading into a curvature of the land, or peninsula, which forms that side of the harbor. Vessels running in from a gale, or waiting for the abatement of one before putting to sea, make this a place of refuge, and hence it is called "Misery Bay." Through the waters of a shoal part of this bay, the blackened remains, the ribs of a sunken vessel are seen projecting; and not far from her, but entirely beneath the water, which is as clear as glass, lie the remains of another; and there they have lain for more than thirty years. These are the remains of two vessels, associated with one of our most brilliant naval achievements; and though the fragments of their wrecks will soon be entirely gone, their names will never be lost while our history remains. They are the *Lawrence*, Commodore Perry's flag-ship at the battle of Lake Erie, and the *Niagara*, to which he went in an open boat, exposed to the fire of the enemy, after the *Lawrence* was disabled. Their history is a part of that of Erie county. In its forests was their birthplace, and appropriately they lie beneath the transparent waters of this beautiful bay.

The story of the battle of Lake Erie is that of glory of these vessels. The fire of the whole British squadron was directed against the "*Lawrence*," Commodore Perry's flag-ship, until she was almost a wreck, and then, as is stated in Cooper's "*Naval History*," "Captain Perry, finding himself in a vessel that had been rendered nearly useless by the injury she had received, and which was dropping out of the combat, got into his boat and pulled after the *Niagara*, on board of which vessel he arrived at half past two. Soon after, the

colors of the *Lawrence* were hauled down, that vessel being literally a wreck.

"The manner in which the *Lawrence* was cut up, being almost without an example in naval warfare. It is understood, that when Captain Perry left her, she had but one gun on her starboard side, or that on which she was engaged, which could be used, and that gallant officer is said to have aided in firing it, in person, the last time it was discharged. Of her crew, 22 were killed and 61 were wounded, most of the latter severely. When Captain Perry left her, there remained on board but fifteen sound men.

"Although much has been justly said of the manner in which the *Bon Homme Richard* and the *Essex* were injured, neither of these ships suffered, relatively, in a degree proportioned to the *Lawrence*. Distinguished as were the two former vessels, for the indomitable resolution with which they stood the destructive fire directed against them, it did not surpass that manifested on board the *Lawrence*."

Of the *Niagara* it is stated, "At this critical moment, (when the victory was thought to have been with the English), the *Niagara* came steadily down, within half pistol shot of the enemy, standing between the *Chippeway* and *Lady Prevost* on one side, and the *Detroit*, *Queen Charlotte*, and *Hunter* on the other. In passing, she poured in her broadsides, starboard and larboard, ranged ahead of the ships, luffed athwart their bows, and continued delivering a close and deadly fire. The shrieks from the *Detroit* told that the tide of battle had turned."

Having separated the individuality of the *Lawrence* and the *Niagara* from the general action in which they were engaged, it will now be proper, as one of the historical incidents of Erie county, to trace the difficulties through which they were called into existence, and carried into the battle which made them so glorious. They were built in and launched from the mouth of a small ravine on the western side of the town of Erie.

The following account of the building and arming of these vessels is in the words of Captain Daniel Dobbins, at this time an aged and most worthy resident of Erie. He was then a sailing master in the navy, and commanded the "*Ohio*," one of Perry's squadron, but which, having been sent to Erie for supplies, was not in the action:

"On the 27th of December, 1810, Commodore Chauncey and Mr. Eckford arrived, and gave further instructions to prepare timber for the two brigs. In February, Mr. Noah Brown arrived out, with a party of carpenters; and in March, Captain Perry arrived; and by May the fleet was in a great state of forwardness. There being no arms of any kind, except a few dilapidated muskets, at this point, Captain Perry kept me employed in transporting guns, etc., from Buffalo, by water, in boats, and by land in wagons. On the 6th day of April, I arrived at Cattaraugus from Buffalo, on the ice, with six teams; one wagon, loaded with a gun weighing thirty-two hundred, arriving at Erie on the eleventh. This gun of thirty-two hundred, was the first piece of ordnance for the defence of the fleet then building, except two three-pound field-pieces borrowed from the state, and they without any shot. All the long guns were brought from New York City, and the short carronades from Washington city. They were all transported by wagons; those from New York via Buffalo, and those from Washington via Pittsburgh. The shot was principally

cast at Pittsburgh; the rigging came mostly from New York; the heavy anchors from Philadelphia, and the small from Pittsburgh. Fine oakum was not to be had, and we were compelled to calk them with 'rope-maker's oakum.'"

Captain Perry having brought the remaining vessels of his squadron into Presque Isle Bay, was there blockaded by the British, until the prospect of roast beef and plum pudding drew John Bull from his watch. Having received an invitation to dine in Canada, at the town of Dover, the British fleet departed on the festive enjoyment. This was Friday, August 2d; two days afterward, on Sunday, Captain Perry commenced the operation of getting his squadron out of the harbor. There were about seven feet of water on the bar, and the brigs, the Lawrence and the Niagara, drew more than this water. The guns of the Lawrence and Niagara, loaded and shotted, were taken out and landed on the beach. Beams were run through the forward and after ports, and rested on scows, sunken to the water's edge; beams or timbers were then blocked up on these foundations, and the water being pumped out of the scows, the vessels were lifted over the bar. Continuing the narrative of Captain Dobbins, he says: "We had succeeded so far, that day, as to get the Lawrence and one or two of the smaller vessels over, when, on the following morning, the blockading squadron hove in sight. The Niagara was on the bar, with all her guns on shore; but it so happened that the wind was in such a direction that the Lawrence, tending to the wind, headed the same way as the Niagara." The enemy was deceived by this circumstance, and did not know that the Niagara was fast on the bar; the foremost ship laid her main top sail to the mast, and after exchanging signals, bore up and stood off. Captain Perry immediately applied to officers of the army, and obtained a detachment of infantry, by the aid of which he got the fleet all over, mounted the guns, and sailed in pursuit of the enemy that night. This account is a little more detailed than that in Cooper's history, and also differs as to the vessel on the bar. Captain Dobbins says that it was the Niagara, and not the Lawrence. This, however, is of no moment.

The result of the first duty of these ships is well known, and is briefly summed up in that memorable dispatch "We have met the enemy and they are ours." Besides the wrecks of the Niagara and Lawrence, in Misery Bay, the citizens of Erie have more animated and noisy memento of the battle of Lake Erie, in the bell which swings in the belfry of the shabby old brick court house. This, which now marks the time for republicans, and calls them to their public assemblages, is the same which tolled the watches on board the Queen Charlotte, the flagship of the British squadron.

Going back to the commencement of the commercial navy which now floats upon the waters of Lake Erie, we find that the first vessel built on the American side of the Lake was built in this country, near the town of Erie. This was the sloop "Good Intent" of forty tons, built by Captain William Lee, about the year 1795. In 1798 a person by the name of Beebe built a sloop, called the Washington; and in 1800 another called the Harlequin. Soon after the commencement of the war, every merchant vessel had disappeared from the Lake.

The first improvement, for deepening the channel, was by the appropriation of ten thousand dollars, by the state in 1822. In 1824, the general government appropriated thirty thousand dollars for the

improvement of the harbor, and General Barnard designed the plan of the works. The old channel was very crooked, and had but four and a half feet water, and was therefore abandoned. At the time the present tiers were erected there was only two and a half feet of water where the channel now runs. A great increase was given to the business of this locality by the construction of the Pittsburgh and Erie Canal.

The object of this little paper has been more to collect those events and incidents associated with the history of Erie county, or of general interest from their nature, rather than to follow out minutely every transaction of interest only to this particular section; and I have been instigated to do so by an inclination to contribute what little may be in my power to the designs and purposes of the Historical Society of my native state and city; and I make the present offering as an evidence more of my wish than my ability to be useful.

CHARTER OF PENNSYLVANIA.

Charles the Second, By the Grace of God, King of England, Scotland, France and Ireland, defender of the faith, &c., To all whome these presents shall come greeting. Whereas our Trustie and well beloved Subject, William Penn, Esquire, sonn and heire of Sir William Penn, deceased, out of a commendable desire to enlarge our English Empire, and promote such useful comodities as may be a benefitt to us and our Dominions, as alsoe to reduce the Savage Natives, by gentle and just manners to the love of civill Societie and Christian Religion hath humbly besought leave of us to transport an ample Colonie unto a certaine Countrey hereinafter described in the partes of America not yet cultivated and planted. And hath likewise humbly besought our Royall Majestie to give, grant, and confirme all the said Countrey with certain privileges and Jurisdiccions requisite for the good Government and safetie of the said Countrey and Colonie to him and his heires forever. KNOWE yee, therefore, that wee, favoring the petition and good purpose of the said William Penn, and haveing regard to the Memorie and meritts of his late father, in divers services, and particularly to his Conduct, courage and discretion under our dearest brother, James Duke of Yorke, in that signall Battell and victorie, fought and obteyned against the Dutch fleete, commanded by the Herr Van Obdam, in the yeare One thousand six hundred sixtie five. In consideration thereof of our special grace, certaine knowledge and meere motion, Have Given and granted, and by this Our present Charter, for us, Our heires and Successors, Doe give and grant unto the said William Penn, his heires and assigns, All that Tract or parte of land in America, with all the Islands therein conteyned, as the same is bounded on the East by Delaware River, from twelve miles distance, Northwards of New Castle Towne unto

the three and fortieth degree of Northerne Latitude if the said River doeth extend soe farre Northwards; But if the said River shall not extend soe farre Northward, then by the said River soe farr as it doth extend, and from the head of the said River the Easterne Bounds are to bee determined by a meridian Line, to bee drawne from the head of the said River unto the said three fortieth degree, the said lands to extend westwards, five degrees in longitude, to bee computed from the said Eastern bounds, and the said lands to be bounded on the North, by the beginning of the three and fortieth degree of Northern Latitude, and on the South, by a circle drawne at twelve miles distance from New Castle Northwards unto the beginning of the fortieth degree of Northerne Latitude; and then by a straight Line Westwards, to the limitt of Longitude above menconed. We doe also give and grant unto the said William Penn, his heires and assignes, the free and undisturbed use, and continuance in and passage into and out of all and singular Ports, harbours, Bayes, waters, Rivers, Isles and Inletts, belonging unto or leading to and from the Countrey, or Islands aforesaid; and all the soyle, lands fields, woods, underwoods, mountaines, hills, fenns, isles, Lakes, Rivers, waters, Rivuletts, Bays and Inletts, scituate or being within or belonging unto the limitts and Bounds aforesaid, together with the fishing of all sortes of fish, whales, Sturgeons, and all Royal and other fishes in the sea, Bayes, Inletts, Waters or Rivers, within the premises, and the fish therein taken, And alsoe all veines, Mines and Quarries, as well discovered as not discovered, of Gold, Silver, Gemms and pretious Stones, and all other whatsoever bee it stones, Metalls, or of any other thing or matter whatsoever, found or to bee found within the Countrey, Isles, or Limitts aforesaid, Wee do, by this our Royall Charter, for us, our heires and Successors, make, Create and Constitute the true and absolute proprietaries of the Countrey aforesaid, and of all other, the premises, saving alwayes to us, our heires and Successors, the faith and allegiance of the said William Penn, his heires and assignes, and of all other, the proprietaries, Tenants and Inhabitants that are or shall be within the Territories and Precints aforesaid; and Saving also unto us, our heires and Successors, the Sovereignty of the aforesaid Countrey, TO HAVE, hold, possesse and enjoy the said Tract of land, Countrey, Isles, Inletts and other the premises, unto the said William Penn, his heires and assignes, to the only proper use and behoofe of the said William Penn, his heires and assignes forever. To be holden of us, our heires and Successors, Kings of England, as of our Casle of Windsor, in our County of Berks, in free and comon socage by fealty only for all services, and not in capite or by Knights service, Yeelding and paying therefore to us, our heires and Successors, two beaver Skins to be delivered att our said Castle of Windsor, on the first day of Januarie, in every yeare; and also the fifth parte of all Gold and Silver Oare, which shall from time to time happen to be found within the limitts aforesaid, cleare of all Charges, and of our further grace, certaine knowledge and meere mocon, wee have thought fitt to Erect, and we doe hereby erect the aforesaid Countrey and Islands, into a province and Seigniorie, and doe call itt Pensilvania, and soe from henceforth wee will have it called, And forasmuch as wee have hereby made and ordeyned the aforesaid William Penn, his heires and assignes, the true and absolute Proprietaries of all the Lands and Dominions aforesaid. March 4, 1682.

William Penn became proprietary of his province of Pennsylvania and territories thereto annexed by four several grants:

(First) The province of Pennsylvania was granted to Penn, by the charter or patent of King Charles II, bearing date of the 4th day of March 1681. This, the royal charter, as it is generally called, was published by the King on the 2d day of April 1681, by the following proclamation:

Charles R.

Whereas his Majesty, in consideration of the great merit and faithful services of Sir William Penn deceast and for divers other good causes him thereunto moving hath been graciously pleased by Letters Patents bearing date of the fourth day of March last, to give and grant unto William Penn Esquire Son and Heir of the said William Penn, All that tract of Land in America Called by the name of Pensilvania as the same is bounded on the East by Delaware River, from twelve miles distance Northwards of New Castle Towne, unto the three and fortieth degree of Northern Latitude, if the said River doth extend soe farr Northwards. And if the said River shall not extend soe farr Northward, then by the said River so farr as it doth extend. And from the head of the said River, the Eastern Bounds to bee determined by a Meridan Line to bee drawn from the head of the said River, unto the said Three and Fortieth Degree; the said Province to extend Westward five degrees in Longitude, to be Computed from the said Eastern bounds, and to bee bounded on the North by the beginning of the Three and Fortieth Degree of Northern Latitude, and on the South by a circle drawn at Twelve miles distance from New Castle Northwards and Westwards unto the beginning of the Fortieth Degree of Northern Latitude and then by a streight Line Westwards, to the limits of Longitude above mentioned. Together with all Powers, Preheminences and Jurisdictions necessary for the Government of the Said Province, as by the said Letters Patents reference being thereunto had, doth more at large appear. His Matie doeth therefore hereby publish and declare His Royal Will and Pleasure that all persons settled or inhabiting within the limits of the said Province doe yield all due obedience to the Said William Penn, his heirs and assignes, as absolute Proprietaries and Governors thereof: as also to the Deputy or Deputies, Agents or Lieutenants lawfully Commissionated by him or them according to the powers and authorities granted by the Said Letters Patents. Wherewith his Matie expects and requires a ready Compliance from all persons whom it may concern as they tender his Maties displeasure. Given at the Court at Whitehall the Second day of April in the three and thirtieth year of his Maties Reigne.

By his Maties Command

CONWAY.

To ye Inhabitants and Planters of Pensilvania in America.

(2 April 1681)

(Second) The deed of the Duke of York for the province of Pennsylvania, in the same terms substantially as the royal charter. This deed was given on the 31st day of August, 1682, and was prompted by the foresight of Penn to protect him in the future against any claims of the Duke which might arise. Third—the grant of the Duke of York to Penn, August 23, 1682, of the town of New Castle, otherwise called Delaware, and a district of twelve miles around it. Fourth—the grant of the Duke of York to Penn, on the same day, of a tract of land extending from twelve miles south of New Castle to the Whorekill or Cape Henlopen, divided into the two counties of Kent and Sussex, which, together with the New Castle district were commonly known by the name of the three lower counties.

His Royal Highness His Grant to William Penn, Esquire of New Castle and twelve miles Circle.

THIS INDENTURE, made ye four & twentieth Day of August, in ye four and thirtieth year of ye Raign of our Sovereign Lord Charles the Second, by ye Grace of God, of England, Scotland, France & Ireland, Kind Defender of ye faith, &c., Annoq. Dino., 1682, Between ye most illustrious Prince, His Royal Highness, James Duke of York & Albany, Earle of Ulster, &c., of ye one part, & Wm. Penn, Esqr., Sonn & heire of Sr. Wm. Penn. Knt., Deced., of ye other part, Witnesseth That his said Royal Highness out of a Special Regard to ye memory & many faithful & Eminent Services heretofore performed by ye said Sr. Wm. Penn to his said Maty & Royal Highness & for ye good will which his said Royal Highness hath & Beareth to ye said Wm. Penn, &c., for & in Consideracon of ye Sum of tenn shillings to him in hand paid by ye said Wm. Penn, at & before ye Ensealing & Delivering hereof, the Receipt whereof is hereby acknowledged, & for other good causes & Consideracons, Doth Bargaine, Sell, Enfeoffe & Confirme unto ye said Wm. Penn, his Heires & Assignes, forever, ALL, that ye towne of New Castle, otherwise called Delaware & all that tract of Land lyeing within ye Compasse or Circle of twelve miles about the same, Scituate, Lyeing & being upon ye River Delaware, in America, & all islande in ye said River Delaware & ye said River & soile thereof, lyeing north of ye Southermost part of ye said Circle of twelve miles about ye said towne, together with all Rents, Services, Royalties, franchises, Duties, Jurisdiccions, Libertyes & privileges thereunto belonging & all ye Estate, right, title, Interest, powers, property, Claime & Demand whatsoever of his said Royal Highness, of, in or to ye same, or any part or parcel thereof, saveing alwayes & Reserving to his said Royal Highness, his agents & servants, free use of all Ports, Wayes & Passages, into, thro' & out of ye Bargained premises, & every part & parcel thereof, To have & to hold ye said Towne & Circle of Twelve miles of Land about ye said Islands & all other ye before menconed or intended to be hereby bargained premises, with their appurtenances, unto ye said Wm.

Penn, his Heires & Assignes, to ye only use & behoofe of him ye said Wm. Penn, his heires & Assignes forever, yielding & paying therefore yearly and every year unto his said Royal Highness, his heires & Assignes ye sum of five shillings of Lawful money of England, at ye Feast of St. Michael & ye Archangel only, & ye said Wm. Penn, for himself, his Heires & Assignes, Doth Covenant & grant to & with his said Royal Highness, his heires & Assignes, shall & will, well & truly, pay or cause to be paid to his Royal Highness, his Heires & Assignes, ye said yearly rent of five shillings, at ye Dayes whereon ye same is reserved to be paid as aforesaid, And his said Royal Highness, for himself, his Heires & Assignes, Doth Covenant & grant to & with ye said Wm. Penn, his Heires & Assignes, by these presents, that his said Royal Highness, his Heires & Assignes, will at any time or times hereafter, during ye space of Seaven yeares next ensuing ye Date hereof, upon request & att ye costs & Charges in ye law of ye said Wm. Penn, his Heires & Assignes, do make & Execute or cause or procure to be made, done & Executed all & every Such further act & acts, Conveyances and Assurances, in Ye law whatsoever for ye further Conveying & Assuring ye said towne & Circle of twelve miles of land aboute ye same & Islands & all other ye promises, with ye appurtenances unto ye said Wm. Penn, his Heires & Assignes, forever, as by ye Counsel Learned in ye Law of ye said Wm. Penn, his Heires & Assignes, shall be reasonably Devised, advised or required. And his said Royal Highness hath hereby made, constituted & appointed John Moll, of New Castle aforesaid, Esqr., & Ephriam Harman, of New Castle aforesaid, Gentl., Jointly & either of them severally, his true and Lawful Attornies, & by these presents doth give & grant unto ye said John Moll & Ephriam Harman, his said Attornies, or either of them, full power & authority for him & in his name & stead into all & Singular ye promises hereinbefore menconed or intended to be hereby aliened, Enfeoffed & Confirmed, & unto every or any part or parcel thereof in ye name of ye whole to enter, & Quiet & peaceable possession & seisin thereof or of any part or parcel thereof in ye name of ye whole to enter & receive, & after peaceable possession thereof had & taken as aforesaid to deliver quiet & peaceable possession & Seisin thereof, or of any part or parcel thereof in ye name of ye whole, to ye said Wm. Penn, his Heires or Assignes, or to his or their Lawfull Attorney or Attorneys Sufficiently authorized to receive & take ye same, & him or them to leave in ye quiet & peaceable possession thereof, according to ye true Intent & meaning of these presents; and his said Royal Highness doth hereby allow of Ratific & Confirme whatsoever ye said John Moll & Ephriam Harman, his said attornies, shall Lawfully do or cause to be done in & about ye premises by Virtue of these presents to be as good & Effectuall in ye Law to all intents & purposes whatsoever, as if his said Royal Highness had done ye same in his own person, or had been present at ye doing thereof. IN WITNESS whereof, his said Royal Highness hath to these presents sett his Hand & Seal ye day & year first above written.

JAMES

Entred ye 21d of Novembr, 1682.

An Act to erect the town of Erie, in the county of Erie, into a borough, and for other purposes.

Section I. (The first section of the town of Erie, erected into a borough. 2. All persons entitled to vote for members of the Legislature, who have resided in the said borough six months previous to the election, shall meet on the first Monday in May, annually, to elect borough officers, and the mode of conducting the election prescribed, and how vacancies in any of the borough offices may be supplied. 3. Borough and town council shall be a body politic and corporate; with power to hold lands, &c. not exceeding in value three thousand dollars per annum. 4. Penalty for refusing or neglecting to serve as burgess or member of the town council, and how recoverable. 5. Officers to take an oath or affirmation to support the constitution, &c. 6. Of enacting bylaws; apportioning taxes; erecting wharves, and appointing a town clerk. Limitations of taxes. 7. Of collecting taxes. 8. By-laws to be recorded. Duties of the town clerk, and of the high constable, prescribed. Persons aggrieved may appeal to the Court of Quarter Sessions. 9. Certain lots granted for churches and burial grounds. 10. Northern boundary of Front street defined, and power of the burgess and town council to lay out lots, &c. on the north side of Front street; and sell the same at public auction. Appropriation of the proceeds. But no building to be erected on the north side of Water street, &c.)

Passed 29th March, 1805.—Recorded in Law Book No. X, page 141.

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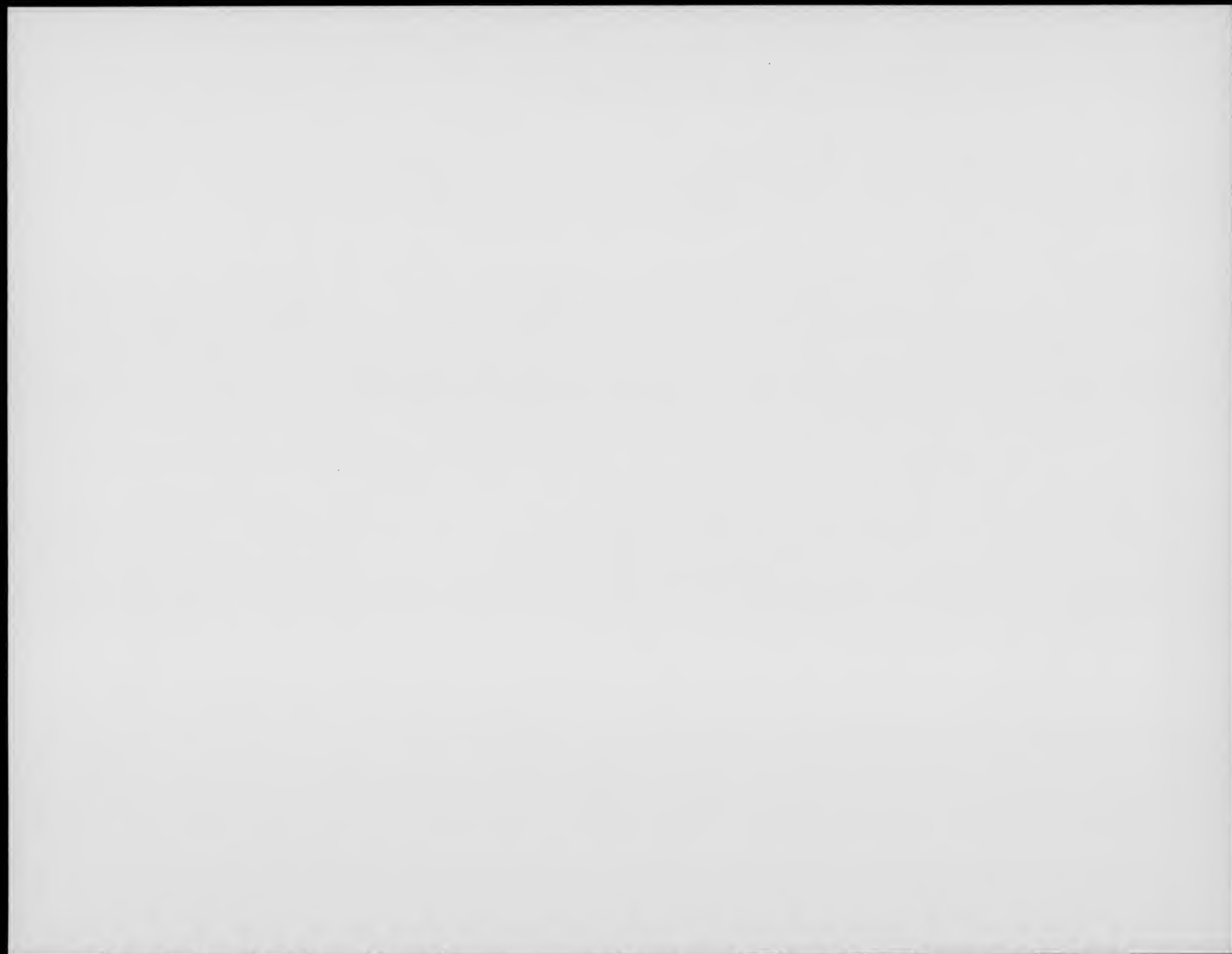
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PLEASE
REWIND

